Alignment Specifications

Item	LH	RH	Total/Split
Front			
Caster	3.2° ± 0.75°	3.2° ± 0.75°	0° ± 0.75°
Camber— GT and Base	-0.50° ± 0.75°	-0.50° ± 0.75°	0° ± 0.75°
Camber— Cobra	-0.90° ± 0.40°	-0.90° ± 0.40°	0° ± 0.40°
Toe (positive value is toe-in, negative value is toe-out)	—	—	0.25° ± 0.25°
Rear, Cobra			
Caster	—	—	—
Camber	-0.8° ± 0.2°	-0.8° ± 0.2°	0° ± 0.50°
Toe (positive value is toe-in, negative value is toe-out)	—	—	0.20° ± 0.15°

General Specifications

Item	Specification
Front Ride Height	
Front	4 mm ± 7.6 mm (0.2 in. ± 0.3 in.)
Rear Ride Height	
Rear — GT and Base	128 mm (5 in.)
Rear — Cobra	18 mm ± 7.6 mm (1.4 in. ± 0.3 in.)
Vehicle Lean (Side-to-Side Differences)	
Front — maximum	13 mm (0.5 in.)
Rear — maximum	13 mm (0.5 in.)
Dogtracking	
Maximum	13 mm (0.5 in.)
Clear vision (negative value is counterclockwise)	-2° ± 3°
Ball Joint End Play	
Lower ball joint — maximum	0.8 mm (1/32 in.)

Torque Specifications

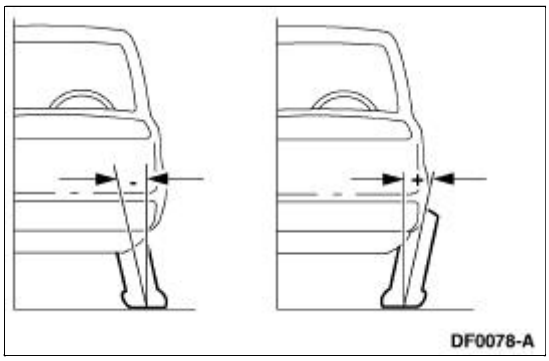
Description	Nm	lb-ft
Front suspension camber adjustment plate bolt	40	30
Front suspension camber adjustment plate nuts	40	30
Rear camber adjustment nut	90	66
Toe link jam nuts	55	41
Tie-rod jam nuts	55	41

Wheel Alignment Angles

Camber and toe are adjustable on the front suspension systems. Front camber is adjusted by moving the top of the strut and spring assembly. Rear camber is adjusted by means of eccentric cams on the rear upper arms. Caster is preset at the factory and should only be adjusted after all other possible sources have been inspected and corrected as necessary. Front toe is adjusted by the use of the front wheel spindle tie rod (3280).

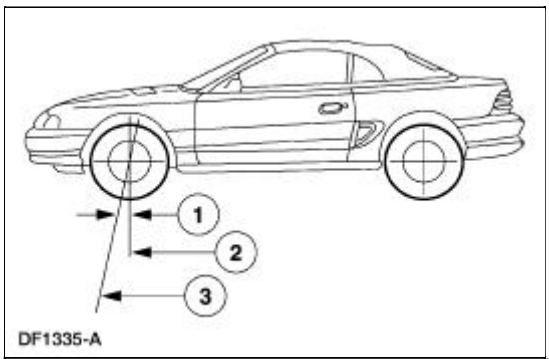
Camber

Negative and Positive Camber



Camber is the vertical tilt of the wheel (1007) when viewed from the front. Camber can be positive or negative and has a direct effect on tire wear.

Caster

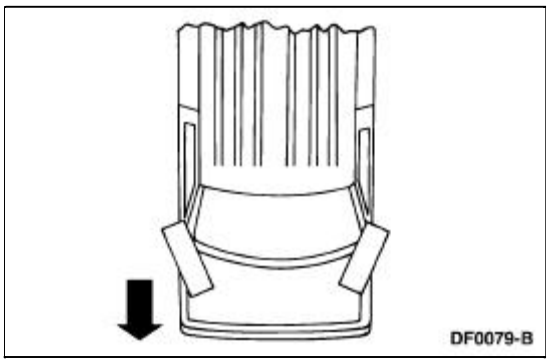


Item	Part Number	Description
1	—	Positive caster
2	—	True vertical
3	—	Steering axis

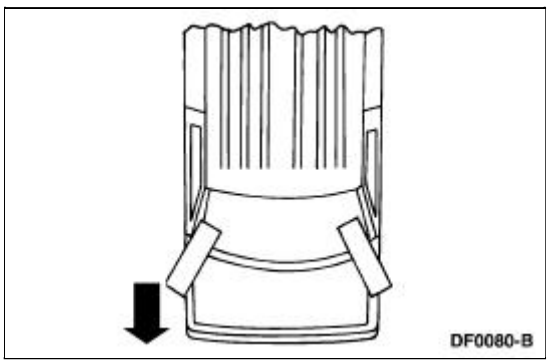
Caster is the deviation from vertical of an imaginary line drawn through the ball joints when viewed from the side. Caster specifications in this section will give the vehicle the best directional stability characteristics when loaded and driven. Caster setting is not related to tire wear.

Toe

Positive Toe (Toe In)



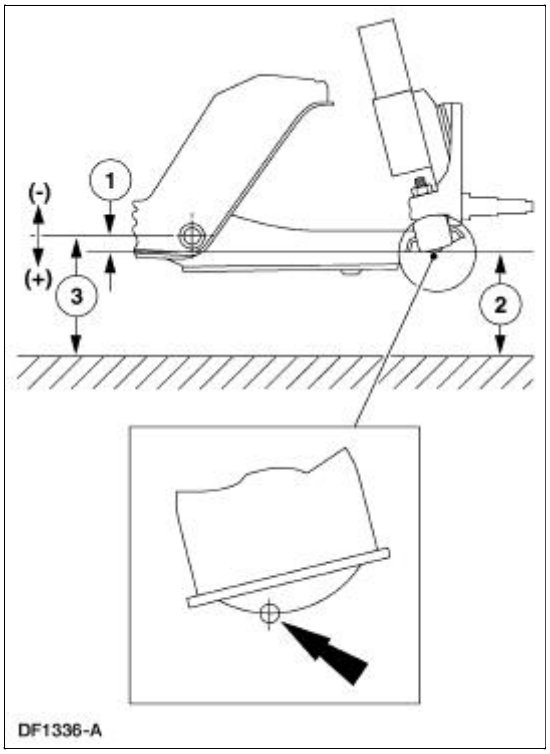
Negative Toe (Toe Out)



The vehicle toe setting affects tire wear and directional stability.

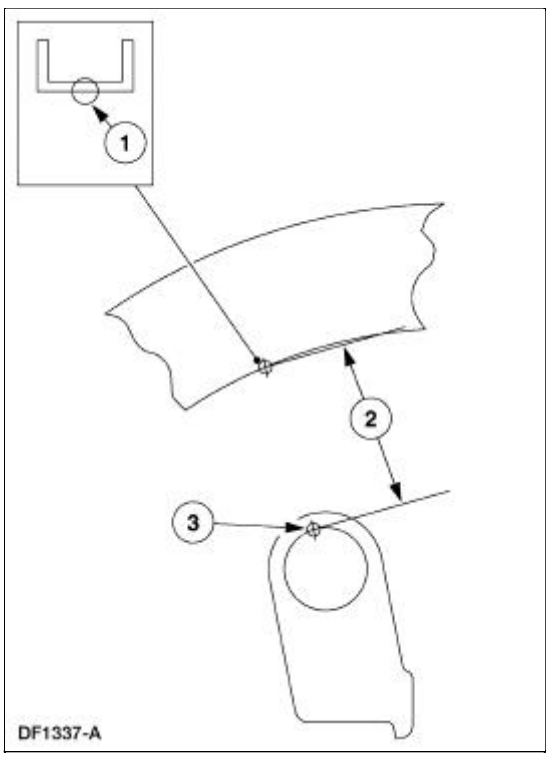
Ride Height

Front Ride Height Measurement



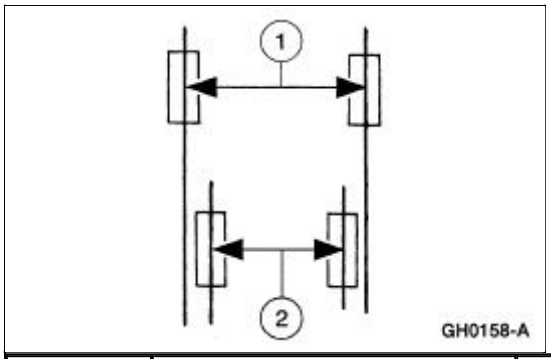
Item	Description
1	Ride height = B - A
2	Measurement A
3	Measurement B

Rear Ride Height Measurement — GT and Base



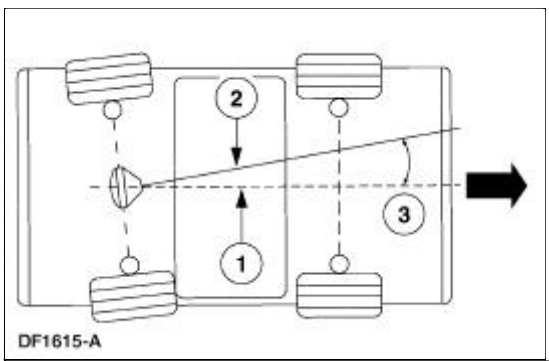
Item	Description
1	Body reinforcement
2	Ride height (shortest distance)
3	Rear axle

Wheel Track



Item	Part Number	Description
1	—	Front track
2	—	Rear track

Dogtracking



Item	Part Number	Description
1	—	Vehicle centerline
2	—	Axle centerline
3	—	Thrust angle

Dogtracking or thrust angle is the condition in which the rear axle is not square to the chassis. Heavily crowned roads can give the illusion of dogtracking.

Wander

Wander is the tendency of the vehicle to require frequent, random left and right steering wheel (3600) corrections to maintain a straight path down a level road.

Shimmy

Shimmy, as observed by the driver, is large, consistent, rotational oscillations of the steering wheel resulting from large, side-to-side (lateral) tire/wheel movements.

Shimmy is usually experienced near 64 km/h (40 mph), and can begin or be amplified when the tire contacts pot holes or irregularities in the road surface.

Nibble

Sometimes confused with shimmy, nibble is a condition resulting from tire interaction with various road surfaces and observed by the driver as small rotational oscillations of the steering wheel.

Poor Returnability/Sticky Steering

Poor returnability and sticky steering is used to describe the poor return of the steering wheel to center after a turn or steering correction is completed.

Drift/Pull

Pull is a tugging sensation, felt in the steering wheel, that must be overcome to keep the vehicle going straight.

Drift describes what a vehicle with this condition does with hands off the steering wheel.

- Drift/pull may be induced by conditions external to the vehicle (i.e., wind, road camber).

Poor Groove Feel

Poor groove feel is characterized by little or no buildup of turning effort felt in the steering wheel as the wheel is rocked slowly left and right within very small turns around center or straight-ahead (under 20 degrees of steering wheel turn). Efforts may be said to be "flat on center."

- Under 20 degrees of turn, most of the turning effort that builds up comes from the mesh of gear teeth in the steering gear (3504). In this range, the steering wheel is not yet turned enough to feel the effort from the self-aligning forces at the road wheel or tire patch.
- In the diagnosis of a handling problem, it is important to understand the difference between wander and poor groove feel.

Suspension System

Inspection and Verification

1. Road test.
   - Verify the customer's concern by performing a road test on a smooth road.
2. Inspect tires.
   - Check the tire pressure with all normal loads in the vehicle and the tires cold. For additional information, refer to the vehicle certification (VC) label.
   - Verify that all tires are sized to specification.
   - Inspect the tires for incorrect wear and damage.
3. Inspect chassis and underbody.
   - Remove any excessive accumulation of mud, dirt or road deposits from the chassis and underbody.
4. Inspect for aftermarket equipment.
   - Check for aftermarket changes to the steering, suspension, wheel and tire components (such as competition, heavy duty, etc.) The specifications shown in this manual do not apply to vehicles equipped with aftermarket equipment.
5. Inspect shock absorbers.
   All vehicles are equipped with gas-pressurized hydraulic shock absorbers. These shock absorbers are not adjustable or refillable and cannot be repaired.
   - Oil Leak: A light film of oil (weepage) on the upper portion of the shock absorber is permissible and is a result or correct shock lubrication. Weepage is a condition in which a film of oil accumulates on the thin tube (body) and is normally noticed due to the collection of dust in this area. If shock absorbers exhibit this weepage condition, they are functional units and new shock absorbers should not be installed. Leakage is a condition in which the entire shock absorber body is covered with oil and the oil will drip from the shock absorber onto the pavement. If condition exists:
     - Make sure fluid observed is not from sources other than the shock absorber.
     - Install a new shock absorber, if necessary.
   - Vehicle Sag: Many times new shock absorbers are installed in an effort to solve a vehicle sag concern. Shock absorbers by design are hydraulic damping units only and, unlike suspension springs, do not support any suspension loads. Therefore, installing a new shock absorber will not correct a vehicle sag concern.
   - Installment in Pairs: In the past it was recommended that new shock absorbers be installed in pairs if one unit became unrepairable. New shock absorbers no longer need to be installed in pairs when only one unit is not repairable.

Visual Inspection Chart

Mechanical

- Front wheel bearing(s)
- Loose or damaged front or rear suspension components
- Loose, damaged or missing suspension fastener(s)
- Damaged spring(s)
- Damaged or leaking strut and spring assemblies
- Damaged or leaking shock absorber(s)
- Worn or damaged suspension bushing(s)
- Loose, worn or damaged steering system components
- Damaged axle components

6. If an obvious cause for an observed or reported condition is found, correct the cause (if possible) before proceeding to the next step.

7. If the fault is not visually evident, determine the symptom and GO to Symptom Chart .

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
• Dogtracking	• Excessive rear thrust angle.	• CHECK the wheel alignment. ADJUST as necessary.
	• Front or rear suspension components.	• INSPECT the front and rear suspension system. REPAIR or INSTALL new suspension components as necessary. REFER to Section 204-01 or Section 204-02 .
	• Drive axle damaged.	• REPAIR as necessary. Refer to the appropriate section in Group 205 for the procedure..
• Drift/pull	• Unequal tire pressure.	• ADJUST tire pressure.
	• Excessive side-to-side difference in caster or camber.	• CHECK the wheel alignment. ADJUST as necessary.
	• Tire forces.	• ROTATE tires front to rear.
	• Unevenly loaded or overloaded vehicle.	• NOTIFY the customer of incorrect vehicle loading.
	• Steering components.	• REFER to Section 211-00 .
	• Brake drag.	• REFER to Section 206-00 .
• Front bottoming or riding low	• Strut(s).	• INSTALL new strut(s) as necessary. REFER to Section 204-01 .
	• Front coil springs (5310).	• CHECK ride height. INSTALL new springs as necessary. REFER to Section 204-01 .
• Incorrect tire wear	• Incorrect tire pressure (rapid center rib or inner and outer edge wear).	• ADJUST tire pressure.

	• Excessive front or rear toe (rapid inner or outer edge wear). • Excessive negative or positive camber (rapid inner or outer edge wear). • Tires out of balance (tires cupped or dished).	• CHECK the wheel alignment. ADJUST as necessary. • CHECK the wheel alignment. ADJUST as necessary. • BALANCE tires.
• Rough ride	• Strut(s). • Shock absorber(s). • Front coil springs or rear springs (5560).	• INSTALL new strut(s) as necessary. REFER to Section 204-01 . • INSTALL new shock absorber (s) as necessary. • INSTALL new front coil springs or rear springs as necessary. REFER to Section 204-01 or Section 204-02 .
• Shimmy or wheel tramp	• Loose wheel nut(s). • Loose front suspension fasteners. • Front wheel bearing (s). • Wheel or tire runout. • Tire flatspotting. • Shock absorber(s). • Loose, worn or damaged ball joint (s). • Loose, worn or damaged steering components. • Front wheel alignment.	• TIGHTEN to specification. REFER to Section 204-04 . • TIGHTEN to specification. REFER to Section 204-01 . • REFER to Wheel Bearing Inspection in this section. • REFER to Section 204-04 . • REFER to Section 204-04 . • INSTALL new shock absorber (s) as necessary. • GO to the Ball Joint Inspection component test in this section. • REFER to Section 211-00 . • CHECK the wheel alignment. ADJUST as necessary.
• Sticky steering, poor returnability	• Ball joints. • Steering components.	• GO to the Ball Joint Inspection component test in this section. • REFER to Section 211-00 .
• Steering wheel off-center	• Unequal front or rear toe settings (side-to-side). • Steering components.	• CHECK the wheel alignment. ADJUST as necessary. • REFER to Section 211-00 .
• Sway or roll	• Overloaded, unevenly or incorrectly loaded vehicle. • Loose wheel nut(s).	• NOTIFY the customer of incorrect vehicle loading. • TIGHTEN to specification.

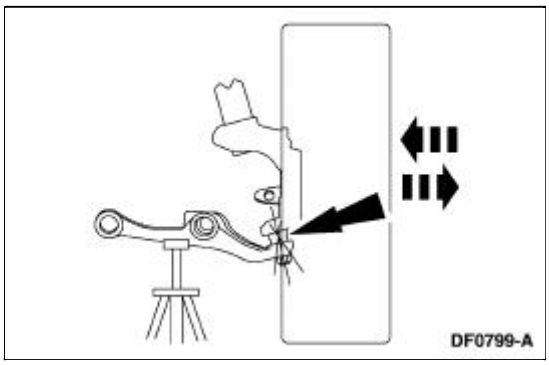
		REFER to Section 204-04 .
	• Strut(s).	• INSTALL new strut(s) as necessary. REFER to Section 204-01 .
	• Shock absorber(s).	• INSTALL new shock absorber (s) as necessary.
	• Loose front stabilizer bar (5482) or rear stabilizer bar (5A772).	• TIGHTEN to specification. REFER to Section 204-01 or Section 204-02 .
	• Worn stabilizer assembly bushing (s).	• INSTALL new bushing(s) as necessary. REFER to Section 204-01 or Section 204-02 .
	• Front coil spring(s) or rear spring(s).	• INSTALL new front coil springs or rear springs as necessary. REFER to Section 204-01 or Section 204-02 .
• Vehicle leans to one side	• Unevenly loaded or overloaded vehicle.	• NOTIFY the customer of incorrect vehicle loading.
	• Front or rear suspension components.	• INSPECT the front and rear suspension system. REPAIR or INSTALL new suspension components as necessary. REFER to Section 204-01 or Section 204-02 .
	• Front coil springs or rear springs.	• INSTALL new front coil springs or rear springs as necessary. REFER to Section 204-01 or Section 204-02 .
	• Incorrect ride height. Lateral tilt out of specification.	• CHECK ride height. INSTALL new front coil springs or rear springs as necessary. REFER to Section 204-01 or Section 204-02 .
• Vibration/noise	• Tire or wheel runout. • Tire flatspotting. • Wheel bearings. • Wheel hubs. • Brake components. • Suspension components. • Steering components.	• REFER to Section 100-04 .
• Wander	• Unevenly loaded or overloaded vehicle.	• NOTIFY the customer of incorrect vehicle loading.
	• Ball joint(s).	• GO to the Ball Joint Inspection component test in this section.
	• Front wheel bearing (s).	• REFER to Wheel Bearing Inspection in this section.
	• Loose, worn or damaged suspension components(s).	• INSTALL new suspension components as necessary. REFER to Section 204-01 or Section 204-02 .
	• Loose suspension fasteners.	• TIGHTEN to specification. REFER to Section 204-01 or Section 204-02 .

	• Steering components. • Wheel alignment.	• REFER to Section 211-00 . • CHECK wheel alignment. ADJUST as necessary (excessive total front toe out).

Component Tests

Ball Joint Inspection

1. Raise and support the vehicle. Refer to Section 100-02 .
2. Prior to performing any inspection of the ball joints, inspect the wheel bearings.
3. Position a safety stand beneath the front suspension lower arm (3079) to be tested.



4. While an assistant pulls and pushes the bottom of the tire, observe the relative movement between the lower spindle arm and the front suspension lower arm ball joint. Any movement at or exceeding the specification indicates a worn or damaged lower ball joint. Install a new front suspension lower arm. Refer to Section 204-01 .

Wheel Bearing Inspection

1. Raise the vehicle until the tire is off the floor. For additional information, refer to Section 100-02 .

2. **NOTE:** Make sure the wheel rotates freely and the brake pads are retracted sufficiently to allow movement of the tire and wheel assembly.

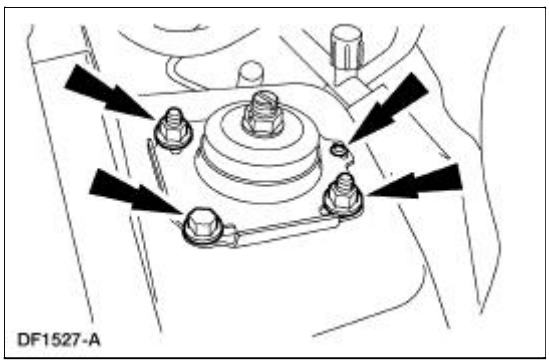
   Grasp each tire at the top and bottom and move the wheel inward and outward while lifting the weight of the tire off the wheel bearing.

3. If the tire and wheel (hub) is loose on the wheel spindle or does not rotate freely, install a new front wheel hub (1104) as necessary. For additional information, refer to Section 204-01 .

Camber and Caster Adjustment —Front

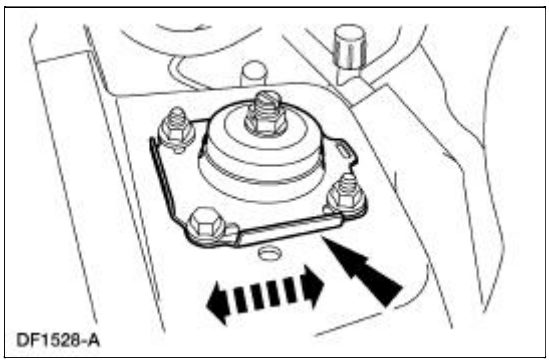
All vehicles

1. Remove the rivet. Loosen the nuts and bolt.



Vehicles requiring camber adjustment

2. Move the front suspension camber adjusting plate (3B391) to the required camber setting.



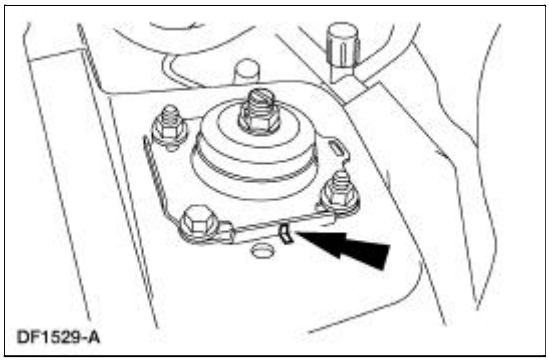
Vehicles requiring caster adjustment

3. **NOTE:** If caster adjustment is necessary to resolve a pull, or out of specification cross-caster split, then slotting the shock tower at the front shock absorber (18124) upper mounting point is an acceptable method. This procedure should not be routinely performed with all alignments and only after all other possible sources have been inspected and corrected as necessary.

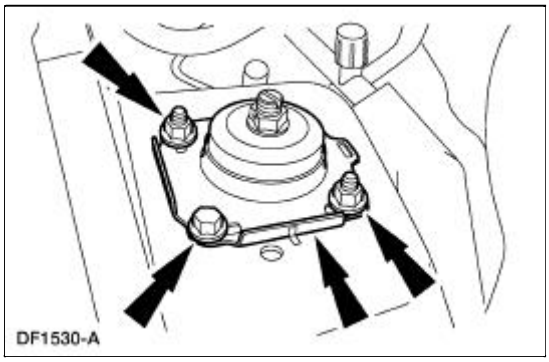
   Determine the amount of caster adjustment needed.

   - If no more than 0.6 degree is needed, only one shock tower needs to be slotted.

4. Mark the camber position of the front suspension camber adjusting plate (3B391).

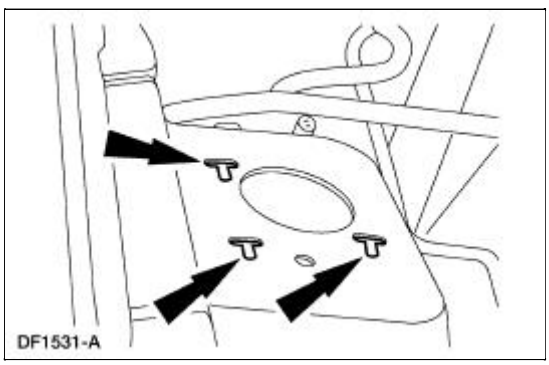


5. Remove the nuts, bolt and the front suspension camber adjusting plate.



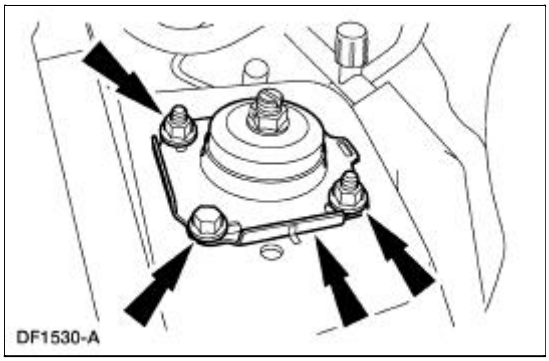
6. Raise the front end. Position the strut and spring assembly out of the way. For additional information, refer to Section 100-02 .

7. Cut slots perpendicular to the existing camber adjustment slots.
   - Moving the top of the front shock absorber toward the rear of the vehicle will increase the caster reading for that side.
   - Each millimeter of adjustment should yield approximately 0.12 degree of caster change.
   - Do not cut slots any longer than 5 mm (0.2 in.) in any direction.
   - Remove any burrs.
   - Clean and paint any exposed metal.

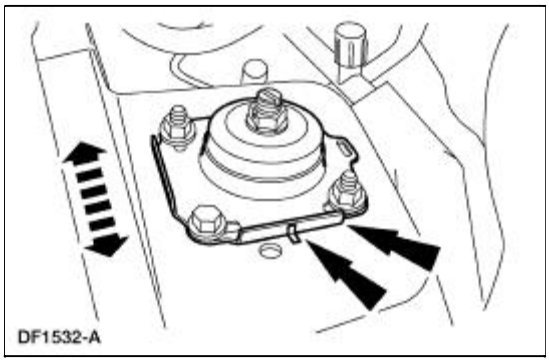


8. Position the strut and spring assembly. Lower the front end.

9. Install the front suspension camber adjustment plate, bolt and nuts. Hand tighten the bolt and nuts.

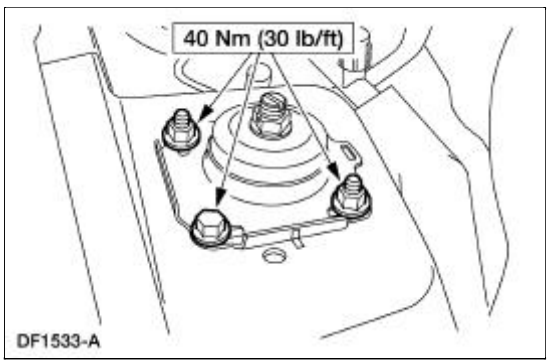


10. Align the camber marks and position the front suspension camber adjustment plate at the correct caster setting.



All vehicles

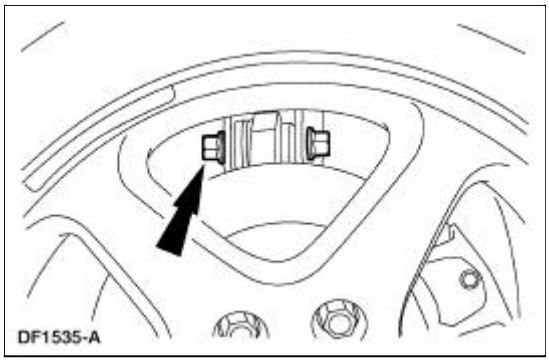
11. Tighten the nuts and bolt.



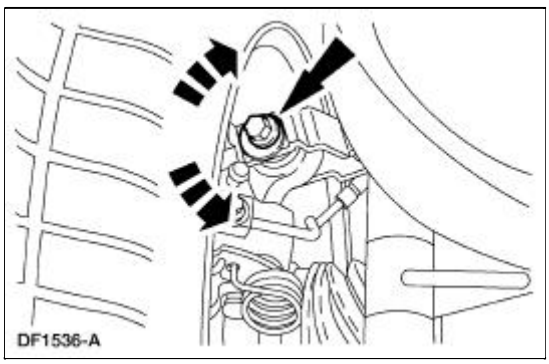
12. Recheck the wheel alignment. Follow the manufacturer's instructions. Adjust as necessary.

Camber Adjustment —Rear

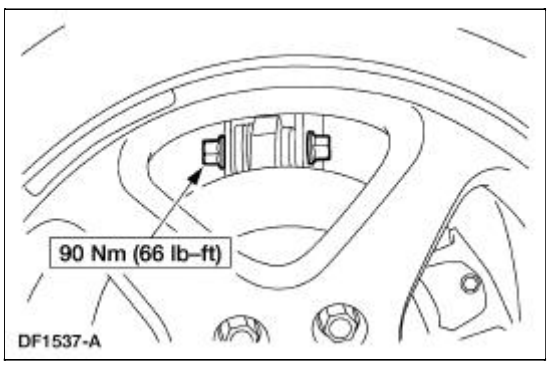
1. Loosen the nut.



2. Rotate the bolt and the cam to the correct camber setting.



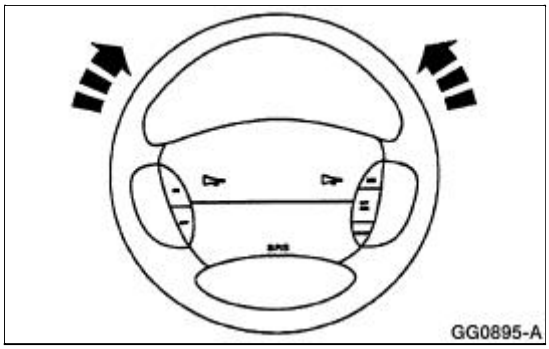
3. Tighten the nut while holding the bolt and the cam stationary.



4. Recheck the wheel alignment. Follow the manufacturer's instructions. Adjust as necessary.

Toe Adjustment —Front

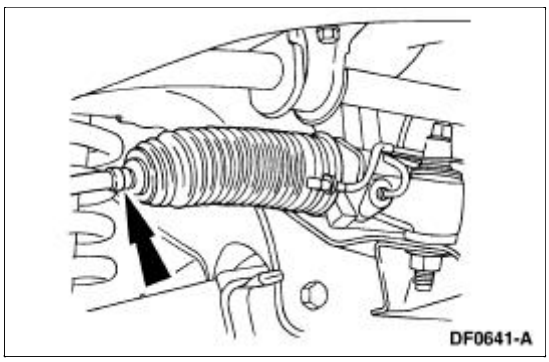
1. Start the engine and center the steering wheel.



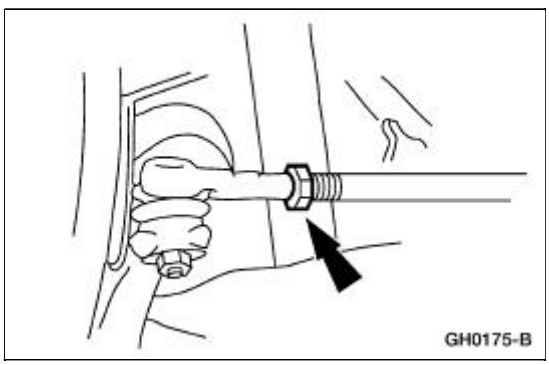
2. Turn the engine off, and hold the steering wheel in the straight forward position by attaching a rigid link from the steering wheel to the seat.

3. Check the toe settings. Follow the manufacturer's instructions.

4. Remove the clamps.

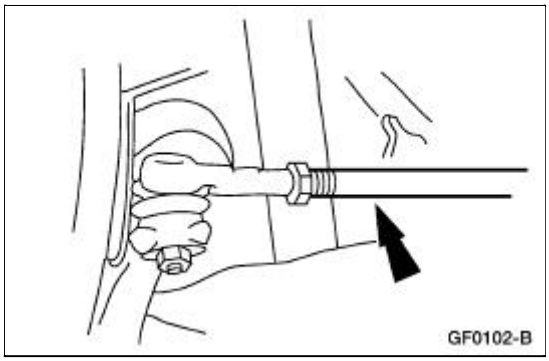


5. Loosen the nuts.
   - Clean and lubricate the nut(s) and front wheel spindle tie-rod threads.

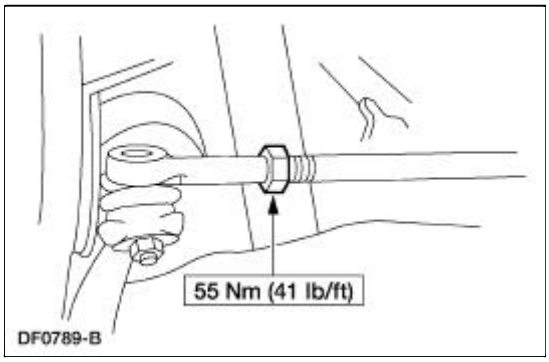


6. **NOTE:** Do not allow the steering gear bellows to twist when the front wheel spindle tie-rod (3280) is rotated.

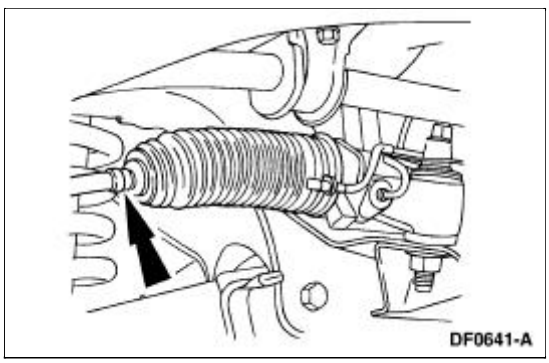
   Rotate the front wheel spindle tie-rods.



7. Tighten the nuts.



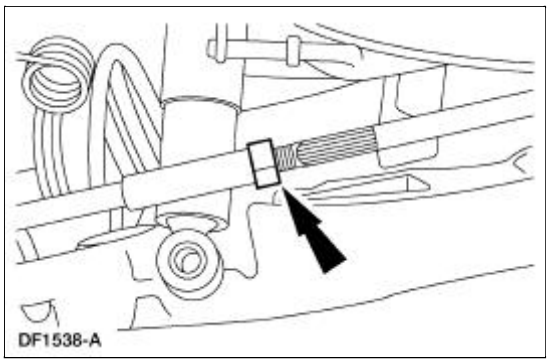
8. Install the clamps.

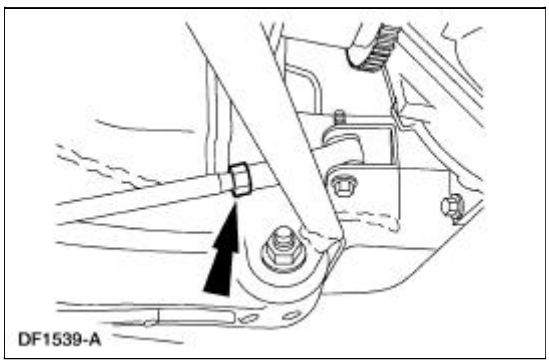


9. Recheck the toe settings. Follow the manufacturer's instructions.

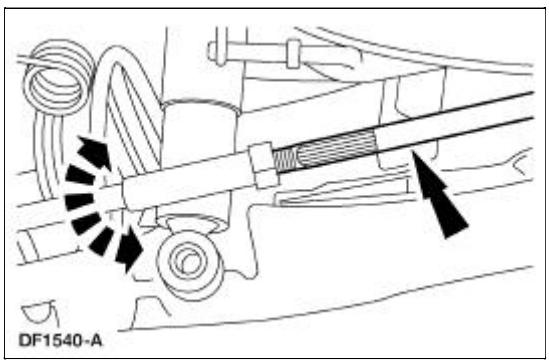
Toe Adjustment —Rear

1. Loosen the nuts.
    - To prevent damage to the ball joints, hold the tie-rod ends while loosening the nuts.

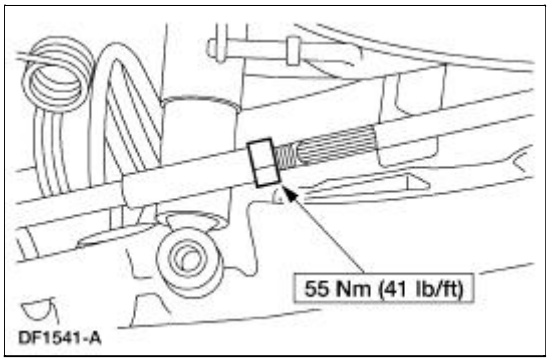


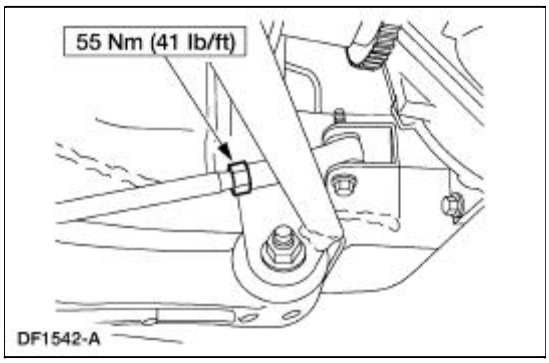


2. Rotate the toe link to the correct toe setting.



3. Tighten the nuts.
    - To prevent damage to the ball joints, hold the tie-rod ends while tightening the nuts.





4. Recheck the toe settings. Follow the manufacturer's instructions.

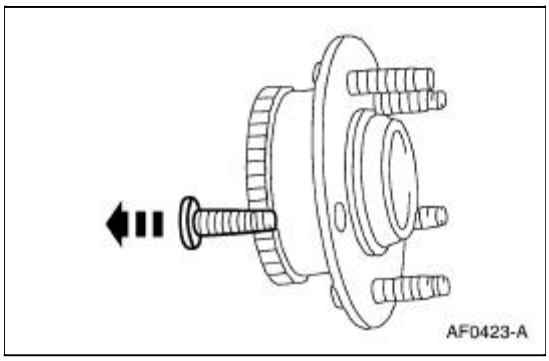
Torque Specifications

Description	Nm	lb-ft	lb-in
Front shock absorber upper nut	100	74	—
Front shock absorber-to-spindle nuts	200	148	—
Shock absorber upper mount-to-body nuts	40	30	—
Shock absorber upper mount-to-body bolt	40	30	—
Wheel hub and bearing retainer nut	350	258	—
Stabilizer bar bracket nuts	70	52	—
Stabilizer bar link nuts	19	14	—
Anti-lock brake sensor bolt	6	—	53
Anti-lock brake sensor wire bracket nut	28	21	—
Ball joint-to-front wheel spindle nut	175	129	—
Front suspension lower arm-to-body nuts	200	148	—
Tie-rod-to-spindle nuts	55	41	—
Steering gear-to-crossmember nuts	70	52	—
Wheel nuts	129	95	—

Wheel Studs

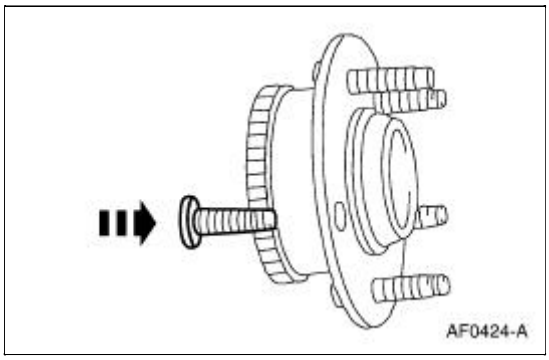
Removal

1. Remove the wheel hub (1104). For additional information, refer to Wheel Hub and Bearing in this section.
2. Using a press, remove the wheel stud (1107) from the wheel hub.



Installation

1. Using a press, install a new wheel stud.



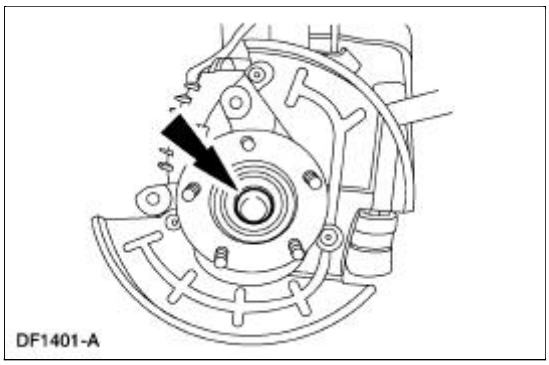
2. Install the wheel hub. For additional information, refer to Wheel Hub and Bearing in this section.

Wheel Hub and Bearing

Removal

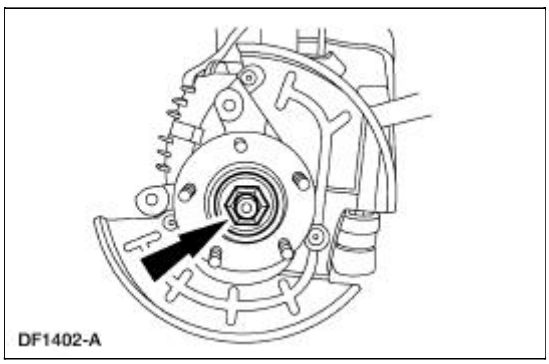
CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number or an equivalent part must be installed, if installation is necessary. Do not use a part of lesser quality or substitute design. Torque values must be used as specified during reassembly to ensure correct retention of these parts.

1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
2. Remove the wheel and tire assembly. For additional information, refer to Section 204-04 .
3. Remove the front brake disc. For additional information, refer to Section 206-03 .
4. Remove and discard the front hub cap grease seal (1N135).

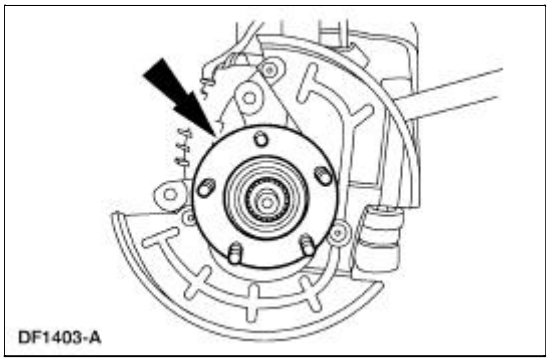


5. **CAUTION: The wheel hub retainer (3B477) is a one time use item and must be replaced with a new retainer when removed. Failure to do so can cause the retainer to come loose during vehicle operation resulting in loss of vehicle control.**

   Remove and discard the front axle wheel hub retainer.



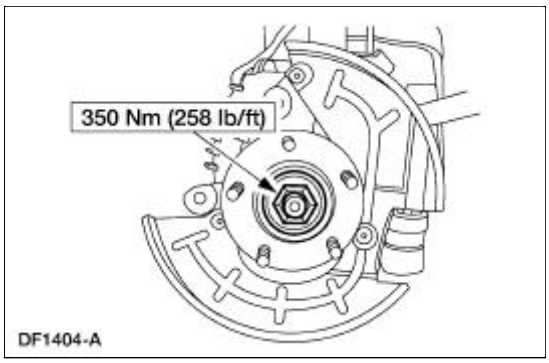
6. Remove the front wheel hub and bearing (1104).



Installation

1. **NOTE:** Use a new wheel hub retainer and hub cap grease seal.

   To install, reverse the removal procedure.

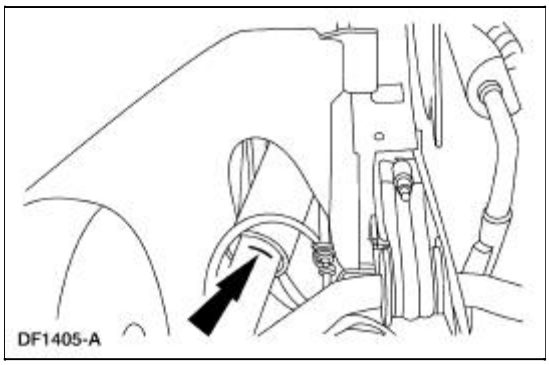


Arm —Lower

Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number or an equivalent part must be installed, if installation is necessary. Do not use a part of lesser quality or substitute design. Torque values must be used as specified during reassembly to ensure correct retention of these parts.

1. Mark the front shock absorber (18124) relative to the protective sleeve with the vehicle in a static, level ground position (curb height).



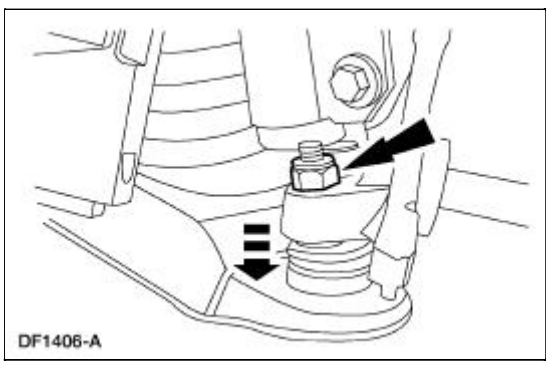
2. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .

3. Remove the wheel and tire assembly. For additional information, refer to Section 204-04 .

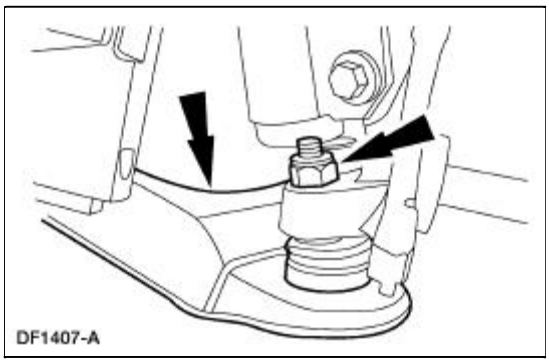
4. Remove the front brake disc shield. For additional information, refer to Section 206-03 .

5. **CAUTION: To prevent damage to the front suspension lower arm (3078) do not remove the nut from the ball joint (3050) at this time.**

   Disconnect the ball joint stud from the arm.
   - Loosen the nut two or three turns.
   - Sharply rap on the front wheel spindle (3105) at the ball joint connection to disconnect the ball joint stud.

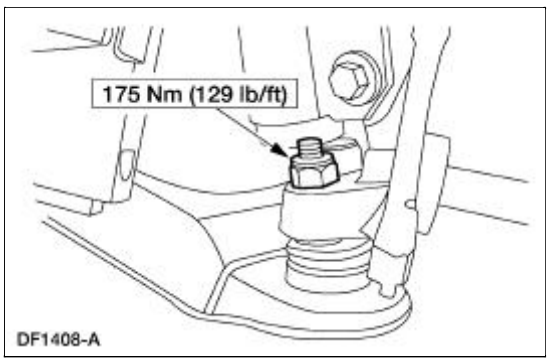


6. Remove the front coil spring (5310). For additional information, refer to Spring in this section.
7. Remove the nut and the front suspension lower control arm. Discard the nut.



Installation

1. To install, reverse the removal procedure.



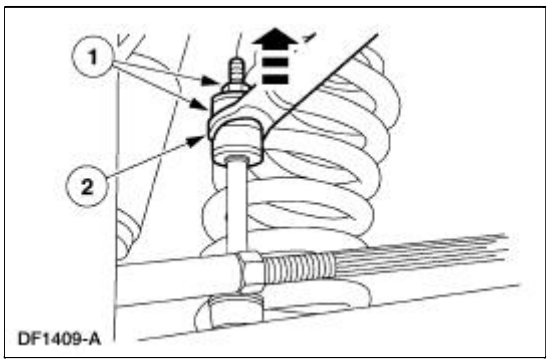
2. Check wheel alignment. Adjust if necessary. For additional information, refer to Section 204-00 .

Bar —Stabilizer

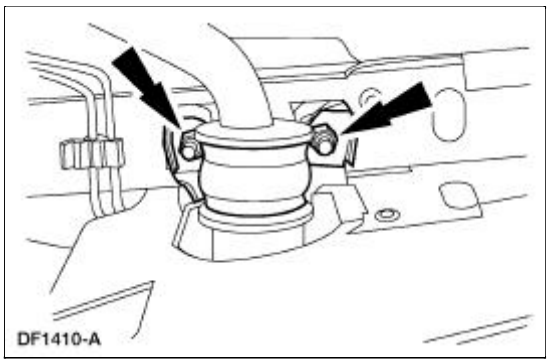
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number or an equivalent part must be installed, if installation is necessary. Do not use a part of lesser quality or substitute design. Torque values must be used as specified during reassembly to ensure correct retention of these parts.

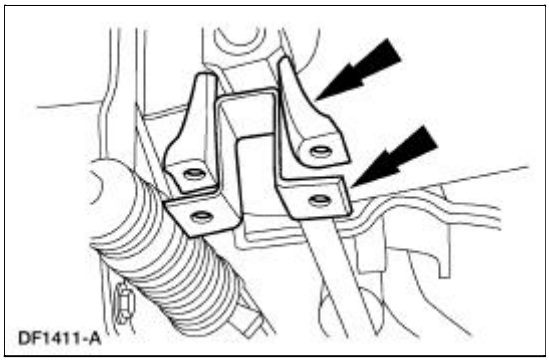
1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
2. Remove the wheel and tire assemblies. For additional information, refer to Section 204-04 .
3. Disconnect the front stabilizer bar links (5K483) from the front stabilizer bar (5482).
    1. Remove the nuts and bushings. Discard the nuts.
    2. Rotate the stabilizer bar to disconnect the links.



4. Remove and discard the nuts.

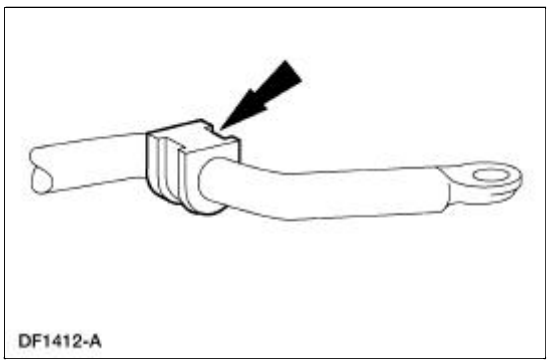


5. Remove the stabilizer bar brackets (5486) and the stabilizer bar mounting bracket adapters (5B482).



6. Remove the stabilizer bar.

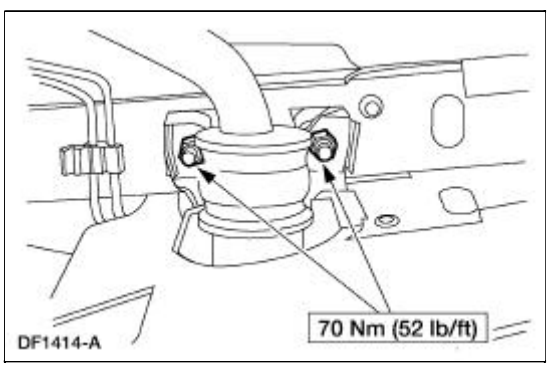
7. If necessary, cut the stabilizer bar insulators (5493) from the stabilizer bar.

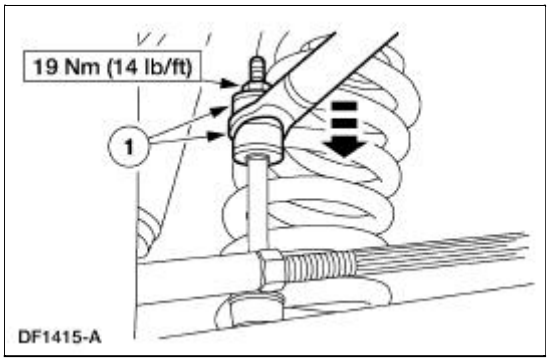


Installation

1. **NOTE:** To aid installation, coat the necessary parts of the front stabilizer bar and the inside diameter of the stabilizer bar bushing with Rubber Suspension Insulator Lube E25Y-19553-A or equivalent meeting Ford specification ESF-M99B112-A.

   To install, reverse the removal procedure.




19 Nm (14 lb/ft)
1
DF1415-A

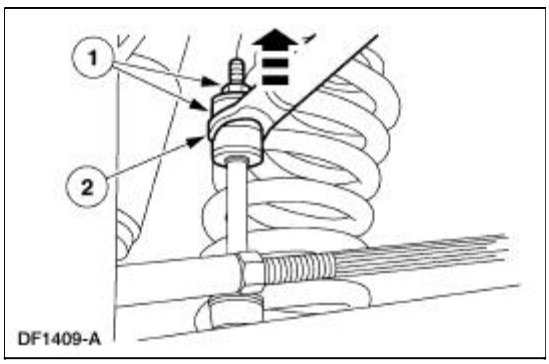
Link —Stabilizer Bar

Removal

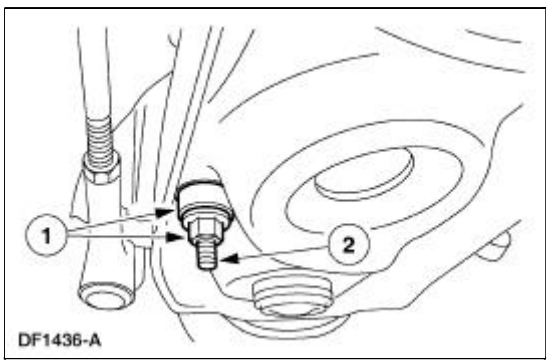
CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number or an equivalent part must be installed, if installation is necessary. Do not use a part of lesser quality or substitute design. Torque values must be used as specified during reassembly to ensure correct retention of these parts.

1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .

2. Disconnect the front stabilizer bar links (5K483) from the front stabilizer bar (5482).
    1. Remove the nuts and bushings. Discard the nuts.
    2. Rotate the stabilizer bar to disconnect the links.

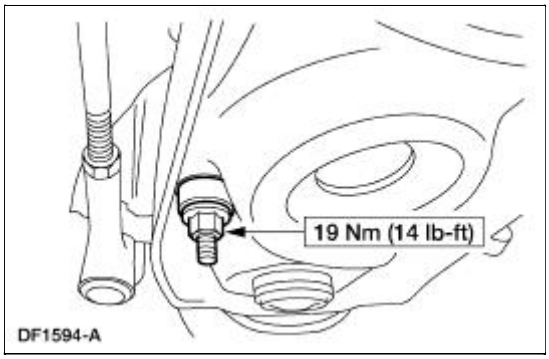


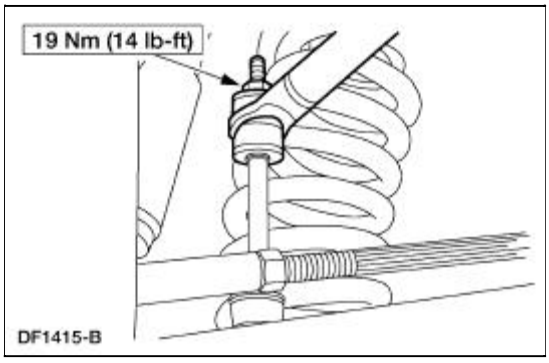
3. Remove the stabilizer bar links.
    1. Remove the nuts and bushings.
    2. Remove the stabilizer bar links.



Installation

1. To install, reverse the removal procedure.


19 Nm (14 lb-ft)
DF1594-A

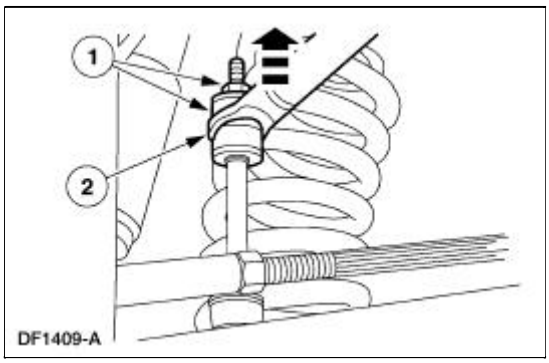

19 Nm (14 lb-ft)
DF1415-B

Bushing —Stabilizer Bar

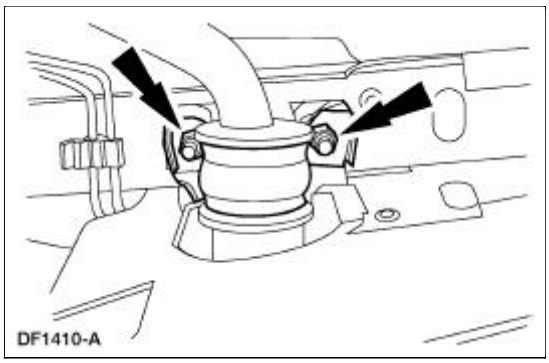
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number or an equivalent part must be installed, if installation is necessary. Do not use a part of lesser quality or substitute design. Torque values must be used as specified during reassembly to ensure correct retention of these parts.

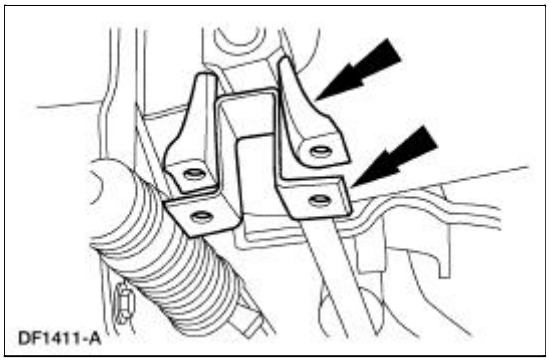
1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
2. Remove the wheel and tire assemblies. For additional information, refer to Section 204-04 .
3. Disconnect the front stabilizer bar links (5K483) from the front stabilizer bar (5482).
    1. Remove the nuts and bushings. Discard the nuts.
    2. Rotate the stabilizer bar to disconnect the links.



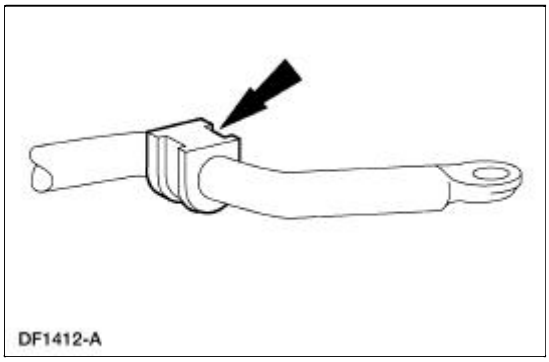
4. Remove and discard the nuts.



5. Remove the stabilizer bar bracket (5486) and the stabilizer bar mounting bracket adapter (5B482).



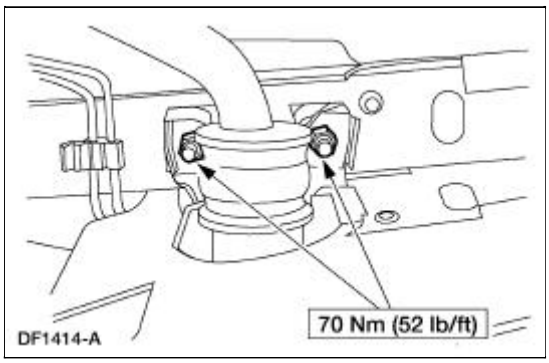
6. Cut the stabilizer bar insulators (5493) from the stabilizer bar.

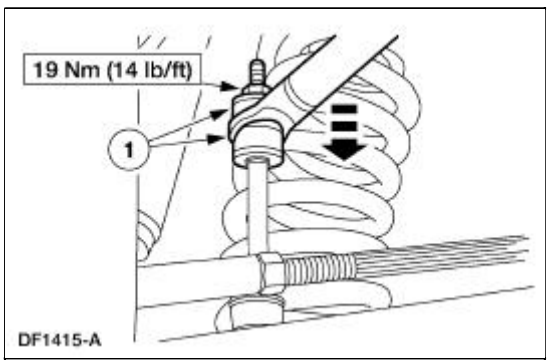


Installation

1. **NOTE:** To aid installation, coat the necessary parts of the front stabilizer bar and the inside diameter of the stabilizer bar bushing with Rubber Suspension Insulator Lube E25Y-19553-A or equivalent meeting Ford specification ESF-M99B112-A.

   To install, reverse the removal procedure.





Spindle

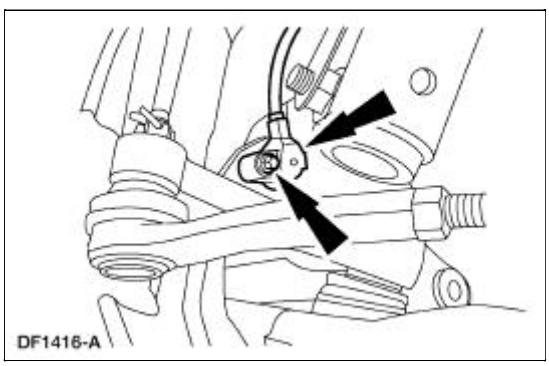
Special Tool(s)

ST1106-A	Tie-Rod End Remover 211-001 (TOOL-3290-D) or Equivalent

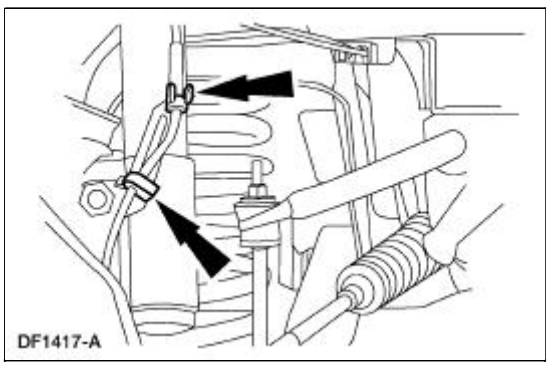
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number or an equivalent part must be installed, if installation is necessary. Do not use a part of lesser quality or substitute design. Torque values must be used as specified during reassembly to ensure correct retention of these parts.

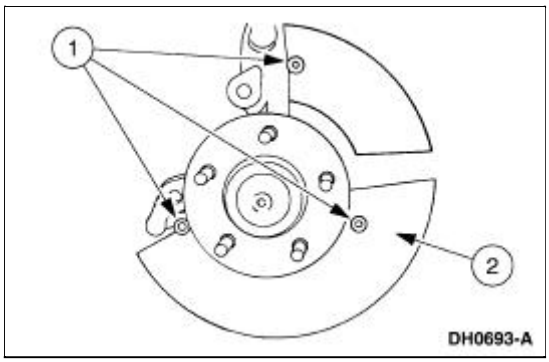
1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
2. Remove the wheel and tire assembly. For additional information, refer to Section 204-04 .
3. Remove the front wheel hub (1104). For additional information, refer to Wheel Hub and Bearing in this section.
4. Remove the bolt and the ABS sensor.



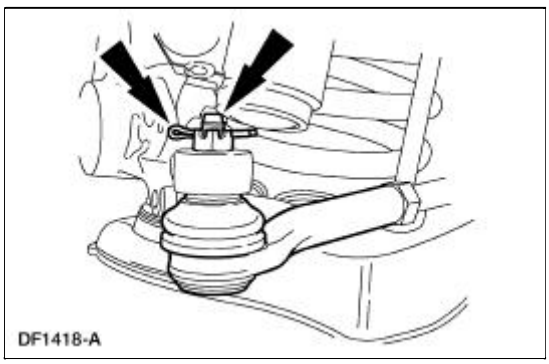
5. Unclip the ABS sensor wire from the bracket.



6. Remove the front brake disc shield.
    1. Remove the three shield rivets.
    2. Remove the shield.

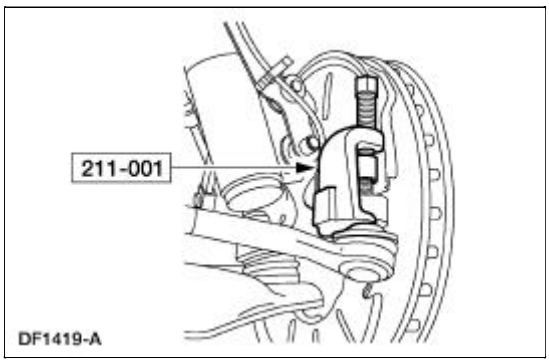


7. Remove the cotter pin and nut. Discard the cotter pin.



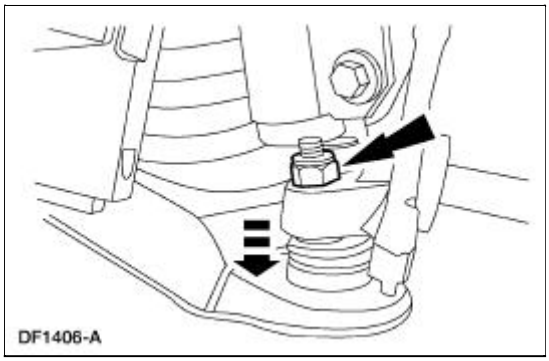
8. **CAUTION: Use care not to damage the tie-rod end dust boot.**

    Using the special tool, disconnect the tie-rod end from the front wheel spindle.



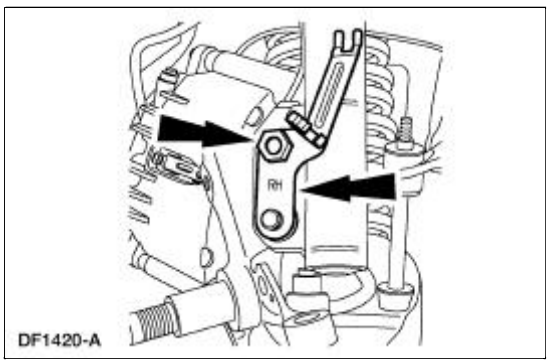
9. **CAUTION: To prevent damage to the front suspension lower arm (3078), do not remove the nut from the ball joint (3050) at this time.**

    Disconnect the ball joint stud from the front wheel spindle (3105).
    - Loosen the ball joint stud two or three turns.
    - Sharply rap on the spindle at the ball joint connection to disconnect the ball joint stud.



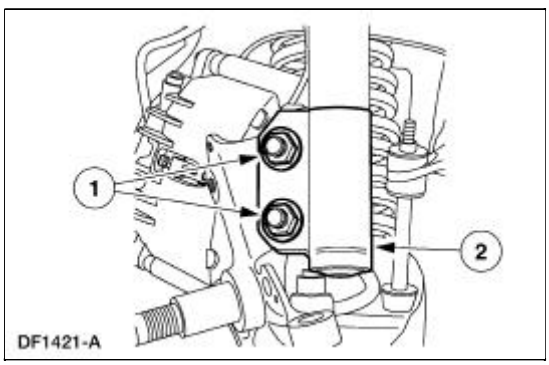
10. Support the front suspension lower arm with a jack stand.

11. Remove the nut and the ABS sensor wire bracket.

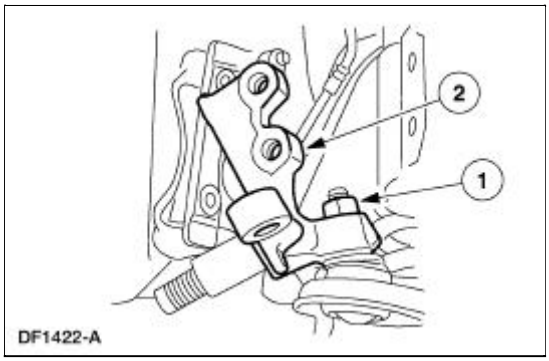


12. **WARNING: All vehicles are equipped with gas pressurized shock absorbers which will extend unassisted. Do not apply heat or flame to the shock absorbers during removal or component servicing. Failure to follow these instructions can result in personal injury.**

    Disconnect the front shock absorber (18124) from the spindle.
    1. Remove and discard the nuts and bolts.
    2. Disconnect the shock absorber.

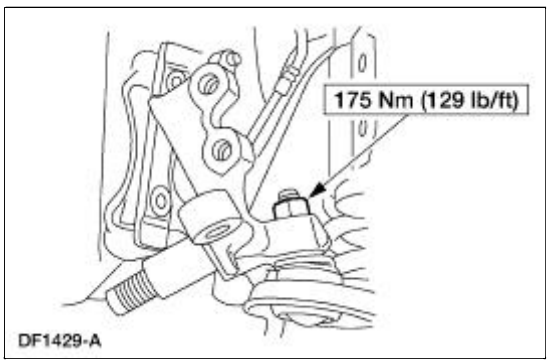


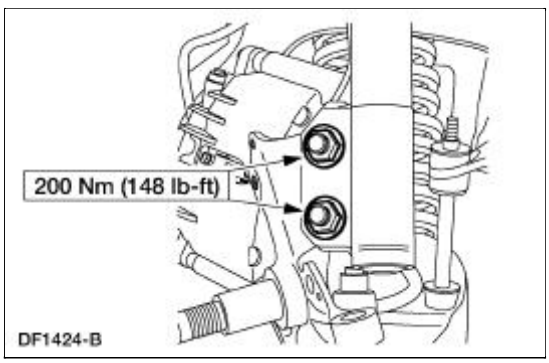
13. Remove the spindle.
    1. Remove and discard the nut.
    2. Remove the spindle.

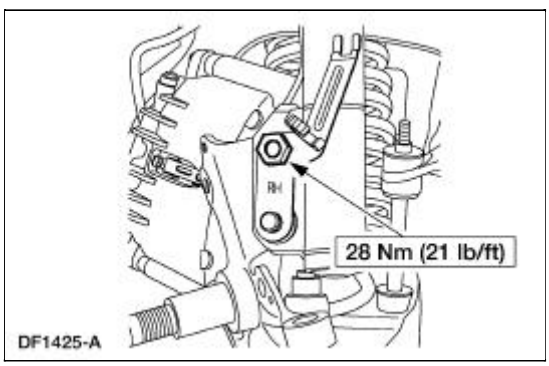


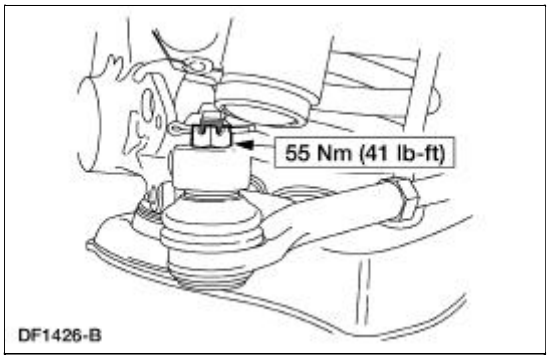
Installation

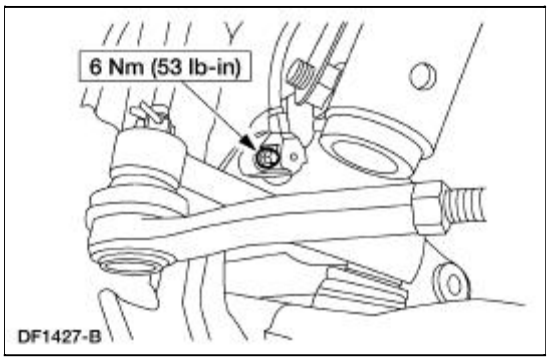
1. To install, reverse the removal procedure.











2. Check wheel alignment. Adjust if necessary. For additional information, refer to Section 204-00 .

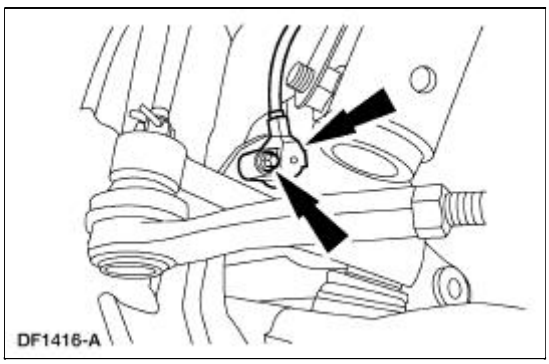
Shock Absorber

Removal

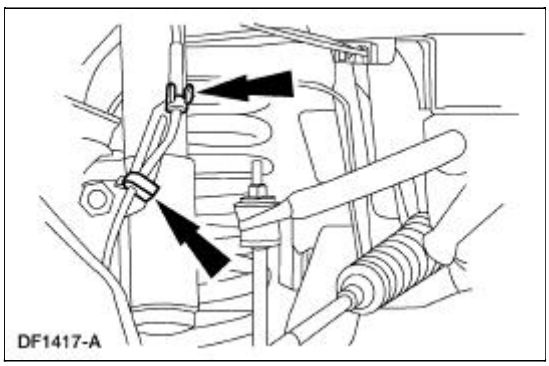
WARNING: All vehicles are equipped with gas pressurized shock absorbers which will extend unassisted. Do not apply heat or flame to the shock absorbers during removal or component servicing. Failure to follow these instructions can result in personal injury.

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number or an equivalent part must be installed, if installation is necessary. Do not use a part of lesser quality or substitute design. Torque values must be used as specified during reassembly to ensure proper retention of these parts.

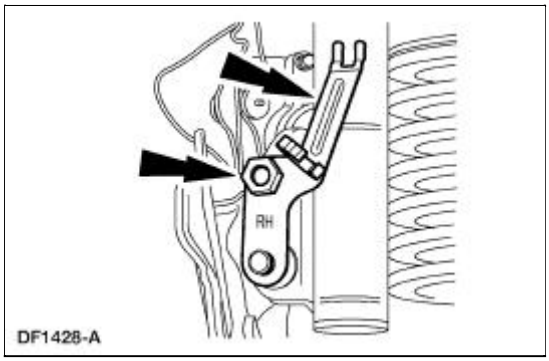
1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
2. Remove the wheel and tire assembly. For additional information, refer to Section 204-04 .
3. Remove the front brake disc. For additional information, refer to Section 206-03 .
4. Remove the bolt and the ABS sensor.



5. Unclip the ABS sensor wire from the bracket.

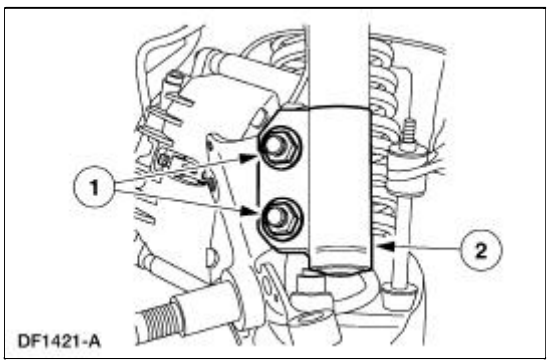


6. Remove the nut and the ABS sensor wire bracket.



7. Support the front suspension lower arm (3078) with a jack stand.

8. Disconnect the shock absorber (18124) from the spindle (3105).
    1. Remove and discard the nuts and bolts.
    2. Disconnect the shock absorber.

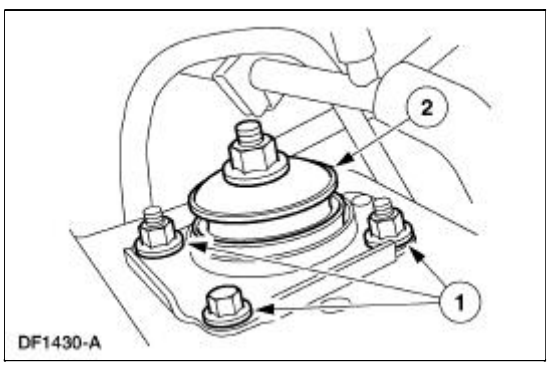


9. Carefully lower the front suspension lower arm and remove the jack stand.

10. **CAUTION: Do not allow the weight of the vehicle to rest on the front brake disc shield. Damage to the shield can occur.**

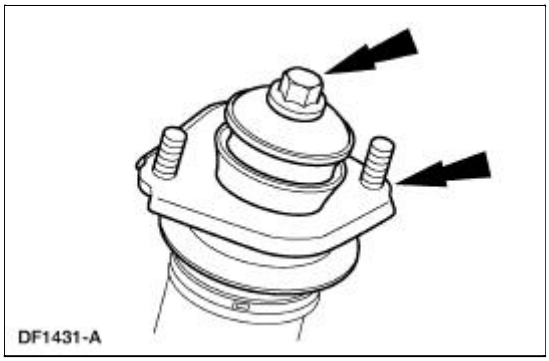
    Lower the vehicle to access the upper mount nuts and bolt.

11. Remove the shock absorber.
    1. Remove the bolt and nuts. Discard the nuts.
    2. Remove the shock absorber.

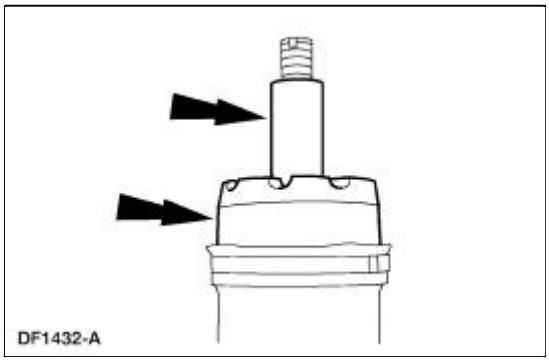


12. Position the shock absorber in a vise.

13. Remove the nut and the front shock absorber mounting bracket (18183).

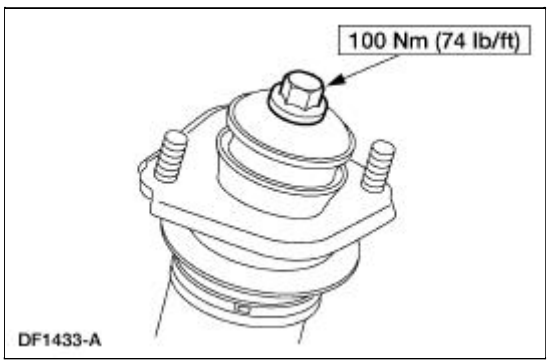


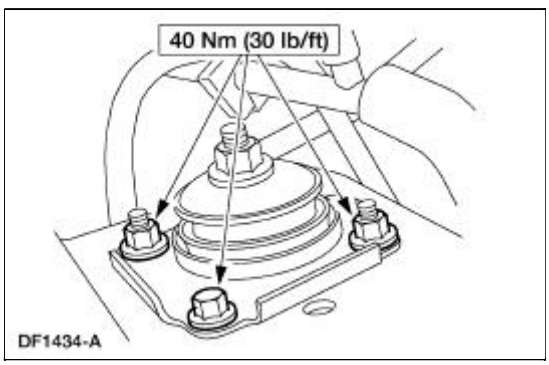
14. Remove the sleeve and the bushing.

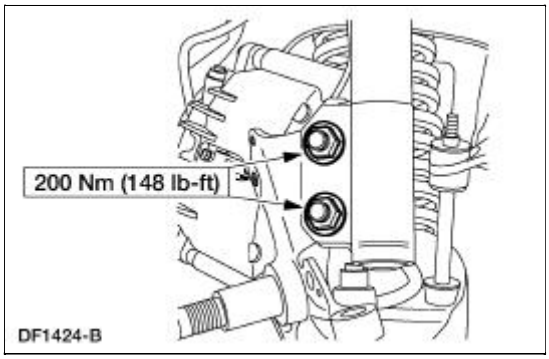


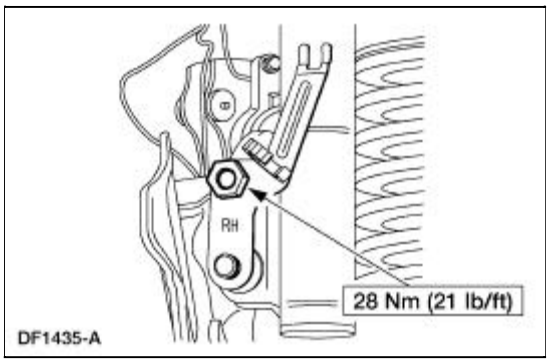
Installation

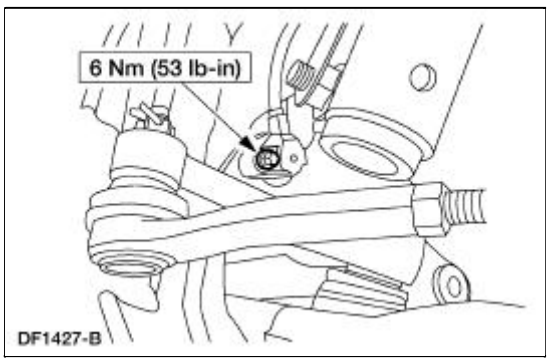
1. To install, reverse the removal procedure.






200 Nm (148 lb-ft)
DF1424-B


RH
28 Nm (21 lb/ft)
DF1435-A


6 Nm (53 lb-in)
DF1427-B

Spring

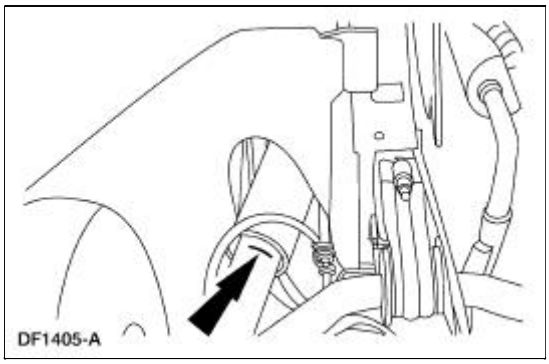
Special Tool(s)

ST1106-A	Tie-Rod End Remover 211-001 (TOOL-3290-D) or Equivalent
ST1352-A	Coil Spring Compressor 204-D001 (D78P-5310-A) or Equivalent

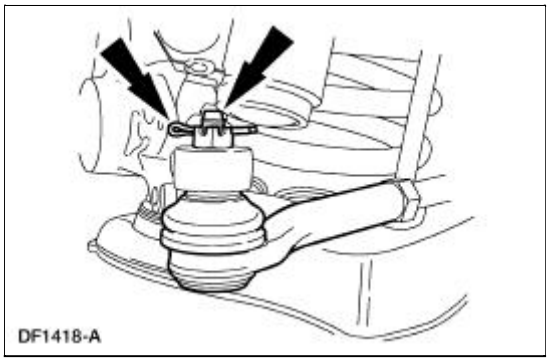
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number or an equivalent part must be installed, if installation is necessary. Do not use a part of lesser quality or substitute design. Torque values must be used as specified during reassembly to ensure proper retention of these parts.

1. Mark the front shock absorber (18124) relative to the protective sleeve with the vehicle in a static, level ground position (curb height).

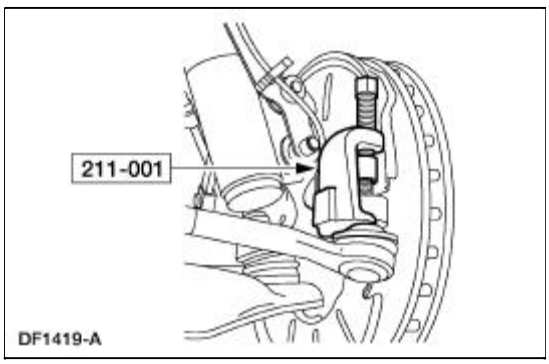


2. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
3. Remove the wheel and tire assembly. For additional information, refer to Section 204-04 .
4. Remove the cotter pin and nut. Discard the cotter pin.

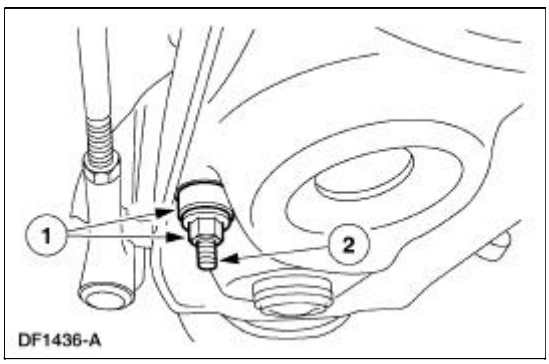


5. **CAUTION: Use care not to damage the tie-rod end dust boot.**

   Using the special tool, disconnect the tie-rod from the spindle.



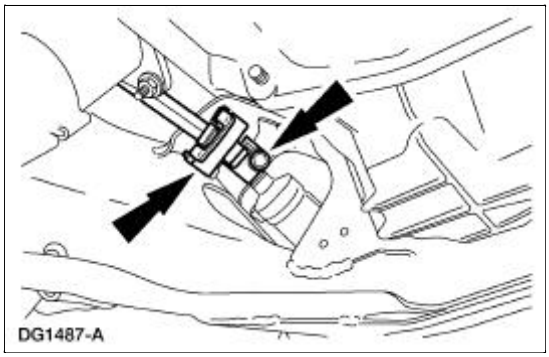
6. Disconnect the front stabilizer bar link (5K483) from the front suspension lower arm (3078).
   1. Remove the nut and bushing.
   2. Disconnect the link.



7. **CAUTION: Do not allow the intermediate shaft to rotate while it is disconnected from the gear or damage to the clockspring can occur. If there is evidence that the intermediate shaft has rotated, the clockspring must be removed and recentered. For additional information, refer to Section 501-20B .**

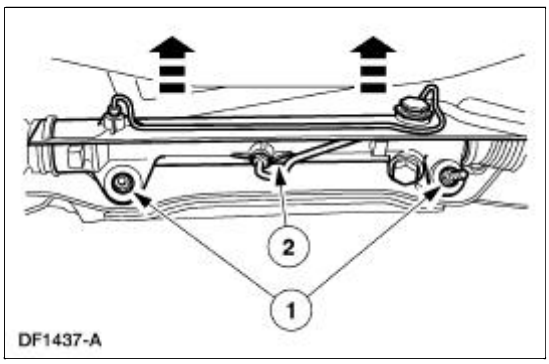
   Remove the bolt and disconnect the intermediate shaft from the gear.

   - Discard the bolt.



8. **CAUTION: Correctly support the power rack and pinion steering gear to avoid damaging the gear and hoses.**

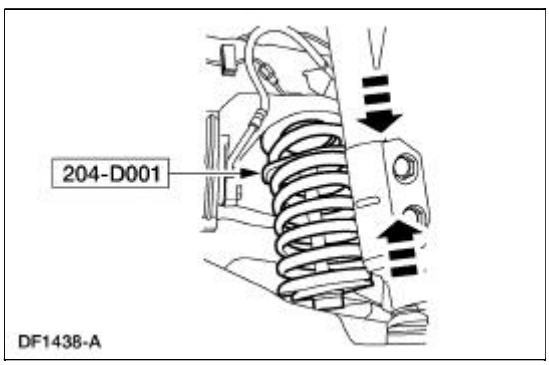
   Position the power rack and steering gear out of the way.
   1. Remove the nuts and bolts.
   2. Position the steering gear so the front suspension lower arm front bolt can be removed.



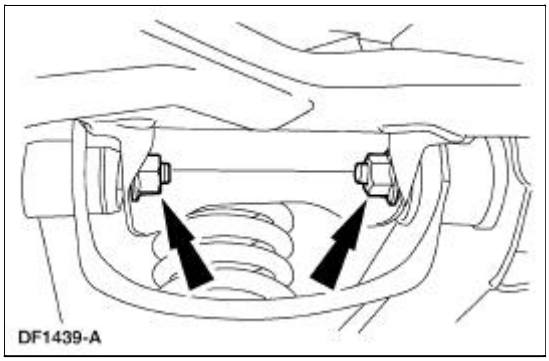
9. Support the front suspension lower arm with a jack stand inboard of the spring seat.

10. **NOTE:** Note position of the front coil spring (5310) in the lower arm spring seat. It must be installed in the same position.

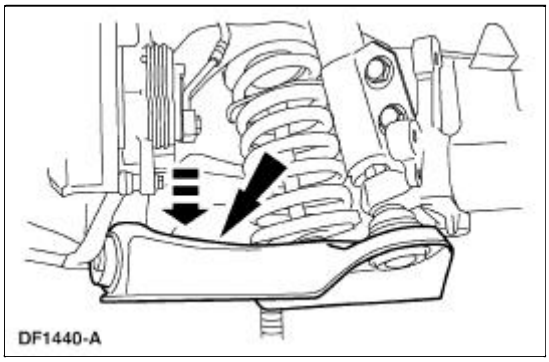
    Using the special tool, compress the spring until it is loose in the spring insulator (5415).



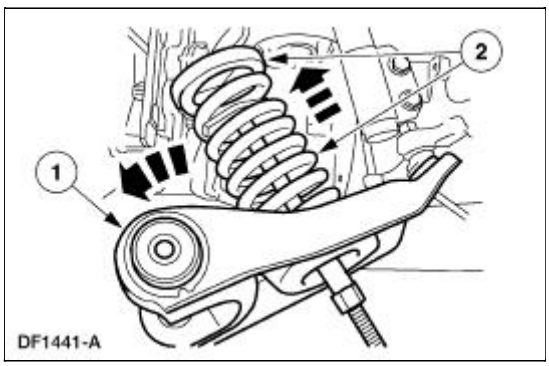
11. Remove the front suspension lower arm pivot nuts and bolts.



12. Lower the front suspension lower arm and remove the jack stand.

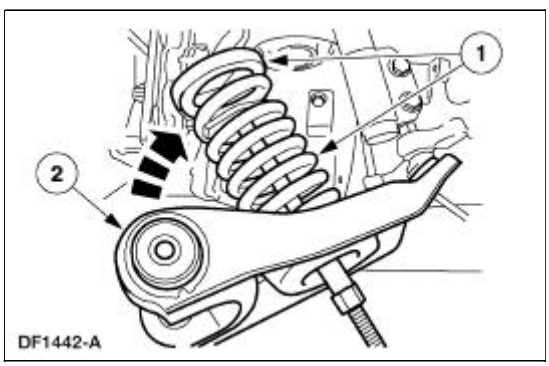


13. Remove the spring.
    1. Swing the front suspension lower arm out of the fender well.
    2. Remove the spring and the spring insulator.

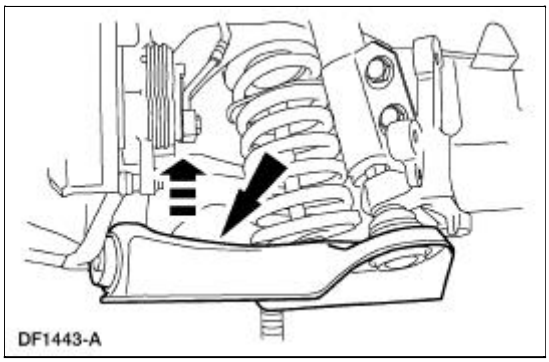


Installation

1. Install the spring.
    1. Position the spring and spring insulator in the front suspension lower control arm.
    2. Swing the arm into the fender well.

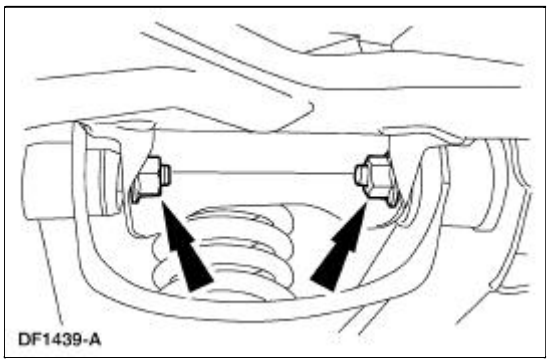


2. Position a jack stand under the front suspension lower control arm inboard of the spring seat and raise the arm into position.

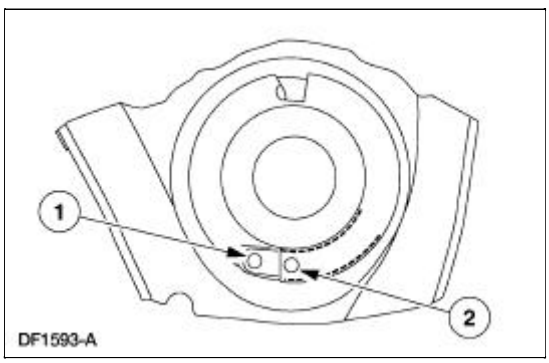


3. **NOTE:** The front suspension lower arm nuts must be tightened with the suspension at curb height.

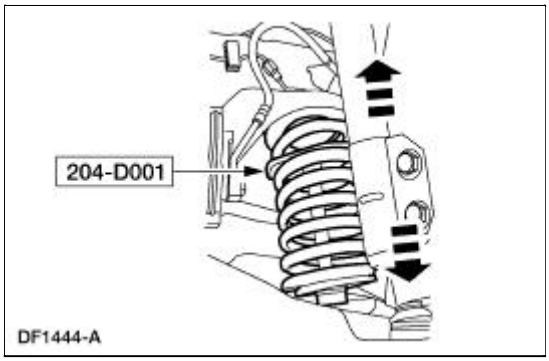
   Install the bolts and nuts. Do not tighten the bolts at this time.



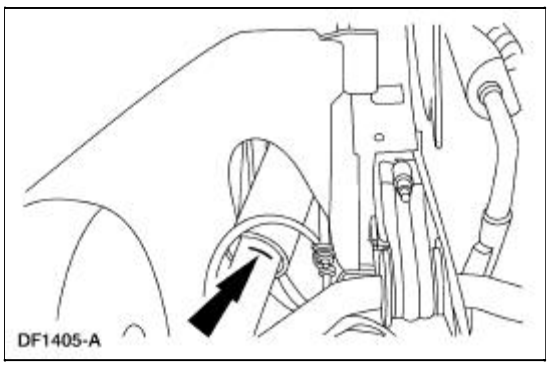
4. Make sure the spring is correctly positioned in the front suspension lower arm.
   1. Spring must not cover this hole.
   2. Spring must cover this hole.



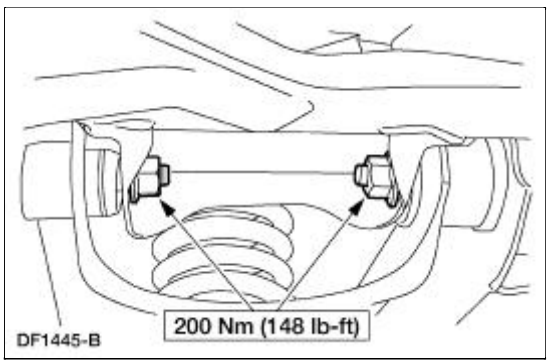
5. Remove the special tool.



6. Move the jack stand under the front suspension lower arm ball joint and raise the suspension until the shock absorber is compressed to the previously established alignment mark (curb height).

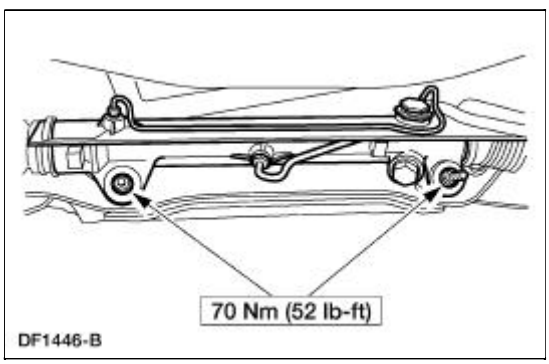


7. Tighten the nuts.

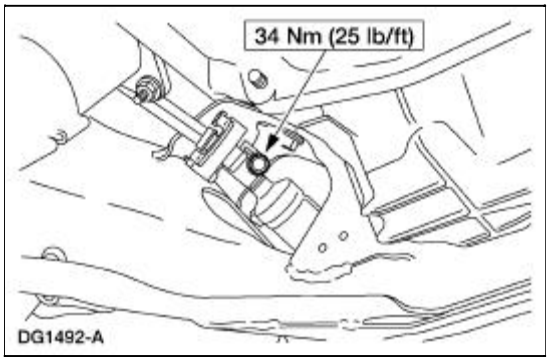


8. Remove the jack stand.

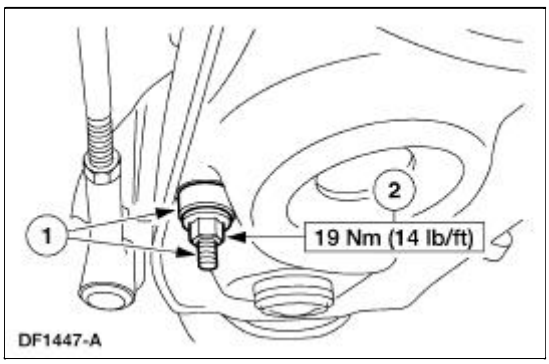
9. Install the power rack and pinion steering gear.



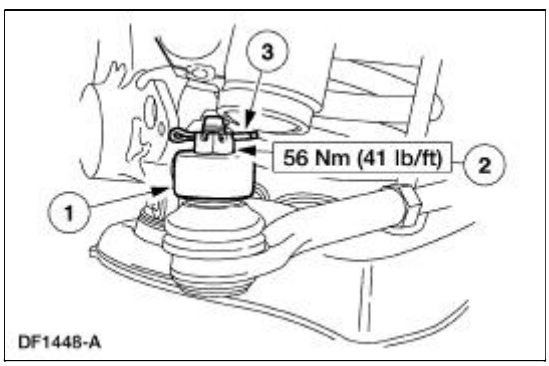
10. Position the intermediate shaft and install the bolt.



11. Connect the stabilizer bar link to the front suspension lower arm.
    1. Install the link and bushing.
    2. Install the nut.



12. Connect the tie-rod end to the spindle.
    1. Install the tie-rod end into the spindle.
    2. Install the nut.
    3. Install a new cotter pin.



13. Install the wheel and tire assembly. For additional information, refer to Section 204-04 .

14. Lower the vehicle.

15. Check wheel alignment. Adjust if necessary. For additional information, refer to Section 204-00 .

Torque Specifications

Description	Nm	lb-ft	lb-in
Mustang			
Rear shock absorber (upper attachment)	40	30	—
Rear shock absorber (lower attachment)	80	59	—
Shock absorber clevis bracket-to-axle nut	108	80	—
Upper arm-to-frame bolt	97	72	—
Upper arm-to-axle bolt	111	82	—
Lower arm-to-body attachment bolt	150	111	—
Lower arm-to-axle bolt	150	111	—
Stabilizer bar-to-lower arm bolt	55	41	—
Parking brake cable bracket	55	41	—
Axle damper front bolt	90	66	—
Axle damper rear nut	90	66	—
Axle damper bracket-to-frame bolt	80	59	—
Pinion bumper mount-to-body bolts	14	10	—
Bracket assembly-to-differential housing bolt	48	35	—
Wheel nuts	129	95	—
Cobra			
Subframe-to-body bolts	103	76	—
Subframe-to-rear bracket bolts	103	76	—
Subframe rear bracket-to-body bolts	80	59	—
Shock absorber-to-lower arm and bushing bolts	133	98	—
Shock absorber-to-body nuts	40	30	—
Upper arm and bushing-to-subframe nuts	90	66	—
Upper arm and bushing-to-knuckle nut	90	66	—
Lower arm and bushing-to-subframe bolts	250	184	—
Lower arm and bushing-to-knuckle nut	115	85	—
Toe link-to-subframe nut	48	35	—
Toe link-to-knuckle nut	48	35	—
Stabilizer bar bracket bolt	55	41	—
Stabilizer bar link nuts	48	35	—
Rear axle differential rear insulator-to-axle housing bolts	103	76	—
Rear brake disc dust shield-to-knuckle bolts	10	—	89
Brake line-to-rear brake caliper bolt	40	30	—
Parking brake cable bracket-to-lower arm and bushing bolt	15	11	—
ABS sensor bolt	23	17	—

Axle shaft-to-hub retainer	325	240	—
Wheel nuts	129	95	—

Rear Suspension

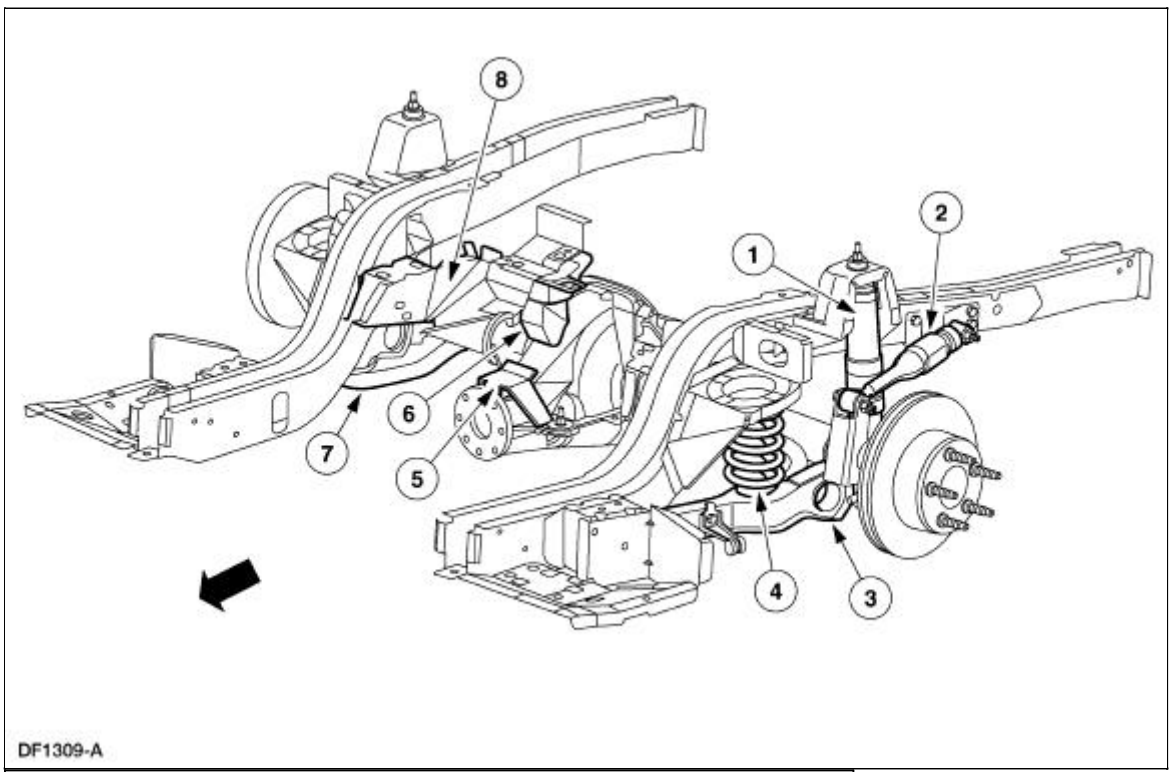
WARNING: All vehicles are equipped with gas pressurized shock absorbers which will extend unassisted. Do not apply heat or flame to the shock absorbers during removal or component servicing. Failure to follow these instructions can result in personal injury.

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

The rear suspension consists of the following components:

- rear spring (4460)
- rear shock absorber (18125)
- rear upper suspension arm and bushings (5500)
  - common LH and RH
- rear lower suspension arm and bushings (5A649)
  - common LH and RH
- rear stabilizer bar (5A772) (4.6 2V-equipped models only)
- axle drive line vibration dampers (4.6 2V-equipped models only)

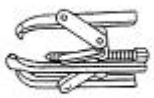
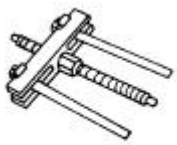
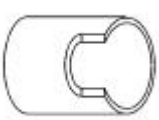
Rear Suspension

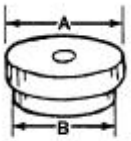


Item	Part Number	Description
1	18125	Rear shock absorber
2	—	Rear axle driveline vibration damper
3	5A649	Rear lower suspension arm and bushing (common LH and RH)
4	5560	Rear spring
5	4731	Rear axle bumper bracket
6	4905	Rear axle differential carrier bumper and bracket
7	5A772	Rear stabilizer bar
8	5500	Rear upper suspension arm and bushing (common LH and RH)

Wheel Hub —Cobra

Special Tool(s)

 ST1184-A	2-3 Jaw Puller 205-D026 (D80L-1013-A) or Equivalent
ST2266-A	Driver 205-199 (T83T-3132-A1)
 ST1516-A	Front Hub Remover Replacer 204-069 (T81P-1104-C)
ST2264-A	Hub Bearing Remover 204-081 (T83P-1104-AH2)
ST2265-A	Hub Dust Seal Replacer 205-289 (T89P-1249-A)
ST2262-A	Rear Hub Remover 205-287 (T89P-1225-AH)
 ST2263-A	Receiving Cup 205-286 (T89P-1104-A)
	Step Plate Adapter 205-D016 (D80L-630-5) or Equivalent

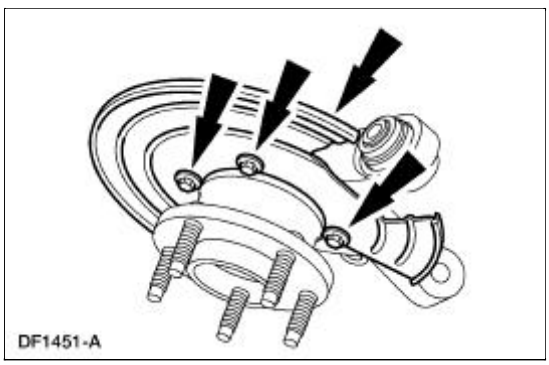
ST1369-A	
 ST1630-A	Step Plate Adapter Set 205-DS011 (D80L-630-A) or Equivalent

Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

1. Remove the rear wheel knuckle (5A968/5A969). For additional information, refer to Wheel Knuckle—Cobra in this section.

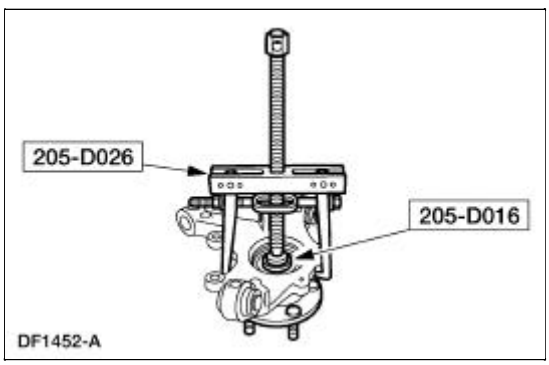
2. Remove the bolts and the dust shield. Discard the bolts.



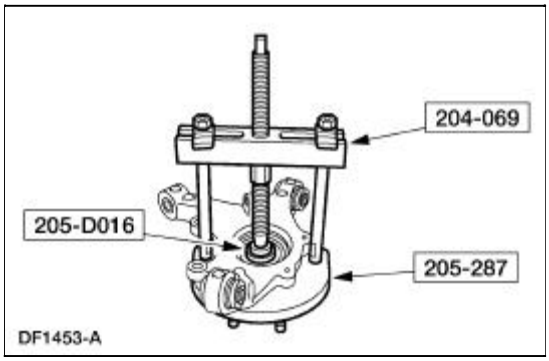
3. Position the knuckle in a vise.

4. **NOTE:** There are two methods for removing the rear hub (1109) from the rear wheel bearing (1A049). Both methods are shown.

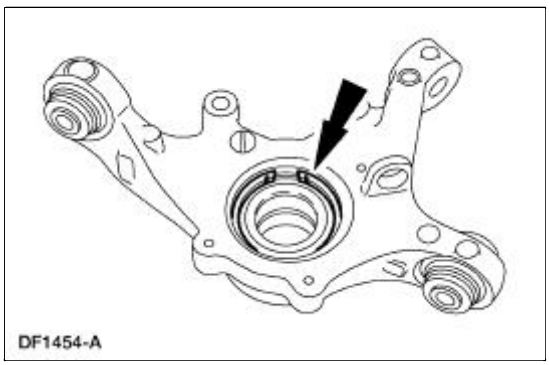
   Method one. Using the special tools, remove the hub.



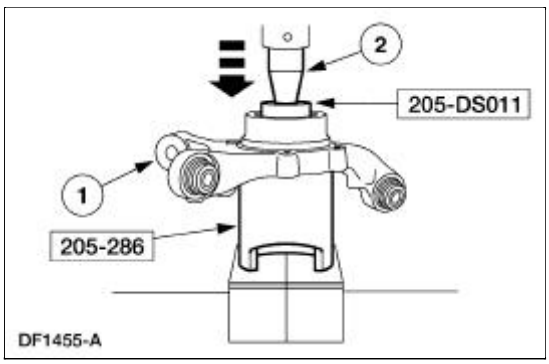
5. Method two. Using the special tools, remove the hub.



6. Remove the snap ring.

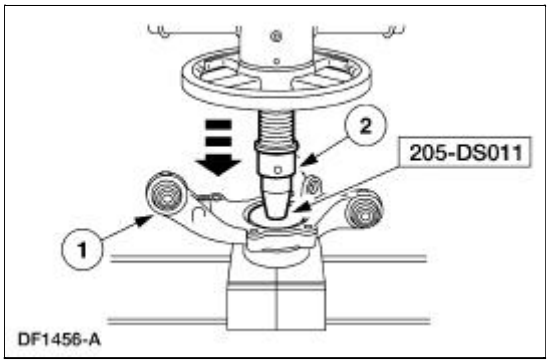


7. Press the wheel bearing from the knuckle.
    1. Position the knuckle on the press bed supported by the special tool.
    2. Using the appropriate step plate adapter, press the bearing from the knuckle.

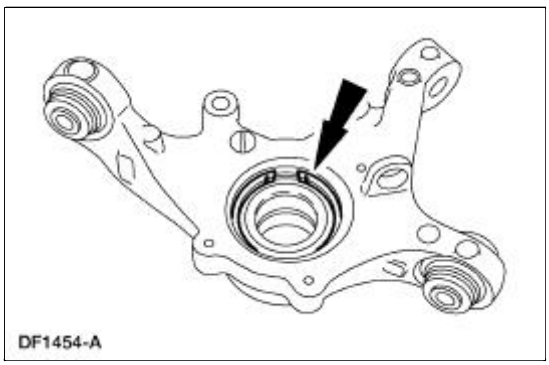


Installation

1. Install the bearing.
    1. Position the knuckle on the press.
    2. Using the appropriate step plate adapter, press the bearing into the knuckle until the bearing clears the snap ring groove and bottoms out in the bore.

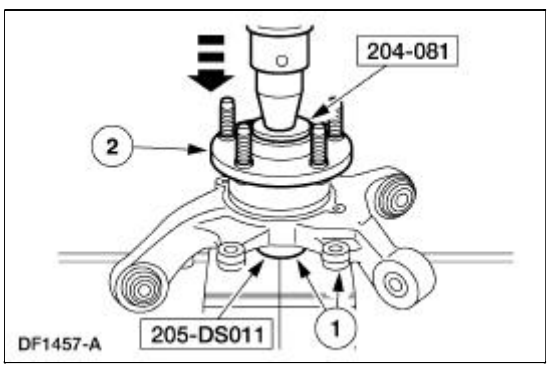


2. Install the snap ring.

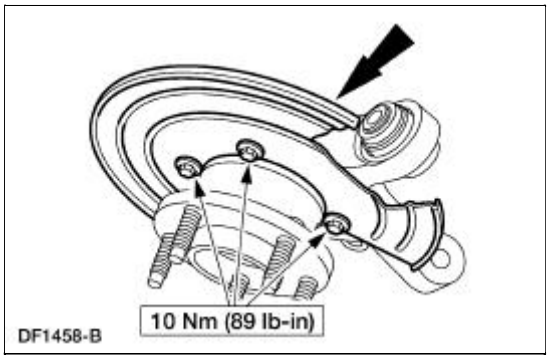


3. **CAUTION: The bearing inner race must be supported during hub installation. Failure to follow these instructions can damage the bearing.**

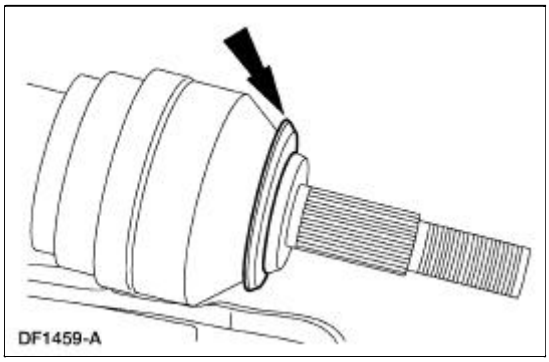
   Install the hub.
   1. Position the knuckle in a press, making sure the wheel bearing inner race is supported with the appropriate step plate adapter.
   2. Using the special tool, install the hub.



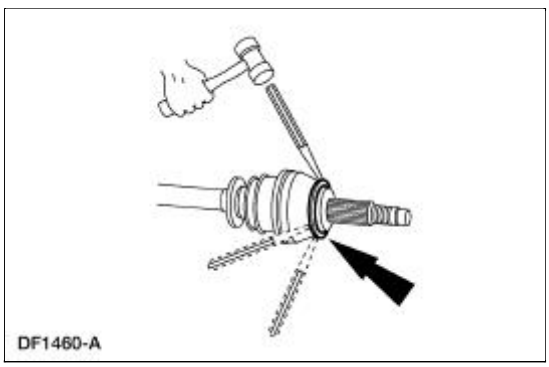
4. Install the dust shield and new bolts.



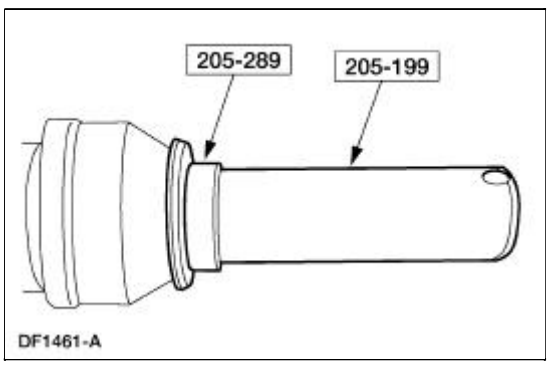
5. Inspect the bearing dust seal. If necessary, install a new dust seal.



6. Using a hammer and chisel, remove the dust seal.



7. Using the special tools, install the dust seal.



8. Install the knuckle. For additional information, refer to Wheel Knuckle—Cobra in this section.

Wheel Studs

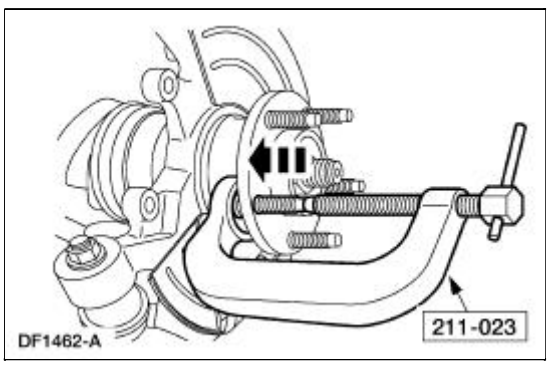
Special Tool(s)

ST1494-A	C-Frame and Clamp Assembly 211-023 (T74P-3044-A1)

Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

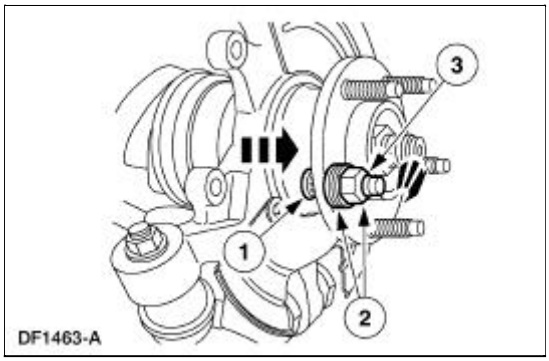
1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
2. Remove the wheel and tire assembly. For additional information, refer to Section 204-04 .
3. Remove the rear brake disc. For additional information, refer to Section 206-04 .
4. Using the special tool, remove and discard the wheel stud.



Installation

CAUTION: Do not use air tools to install the wheel stud. The serrations in the hub flange can be stripped.

1. Install the wheel stud.
    1. Position a new wheel stud in the hub flange making sure the serrations on the stud line up with the serrations in the flange.
    2. Position washers and a reversed wheel nut on the wheel stud.
    3. Tighten the wheel nut until the wheel stud seats on the back of the hub flange.



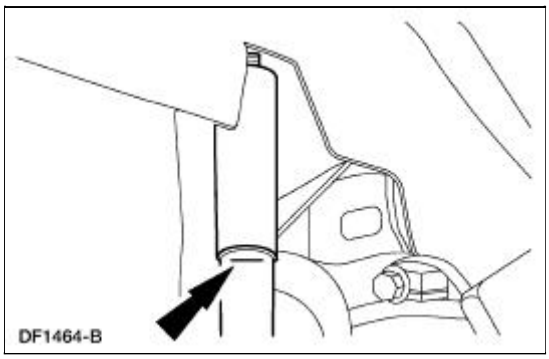
2. Remove the wheel nut and washers. Discard the nut.
3. Install the rear brake disc. For additional information, refer to Section 206-04 .
4. Install the wheel and tire assembly. For additional information, refer to Section 204-04 .
5. Lower the vehicle.

Upper Arm

Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

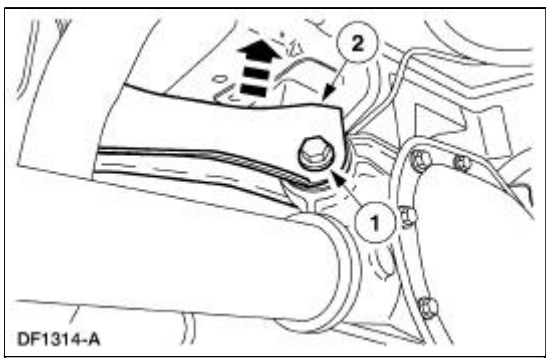
1. Mark the rear shock absorber (18125) relative to the protective sleeve with the vehicle in a static, level ground position (curb height).



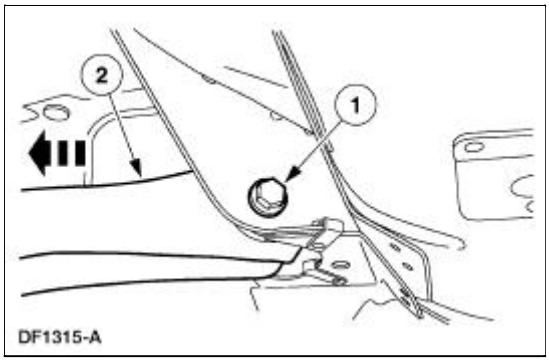
2. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .

3. Support the differential housing with a jack stand.

4. Disconnect the upper arm and bushing (5500) from the axle.
    1. Remove and discard the nut and bolt.
    2. Disconnect the arm and bushing from the axle.

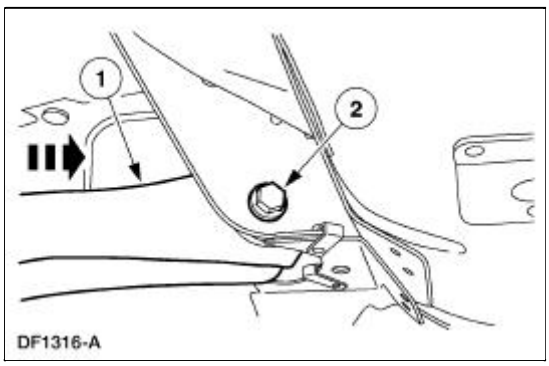


5. Remove the upper arm and bushing from the mounting bracket.
    1. Remove and discard the nut and bolt.
    2. Remove the arm and bushing.

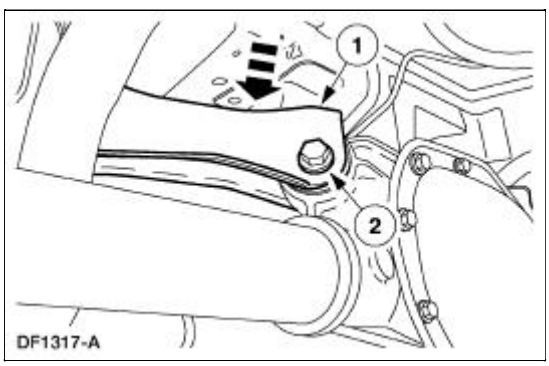


Installation

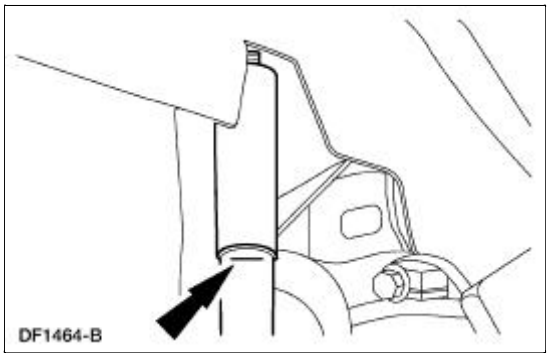
1. Install the upper arm and bushing to the mounting bracket.
    1. Position the arm and bushing.
    2. Install a new nut and bolt. Do not tighten at this time.



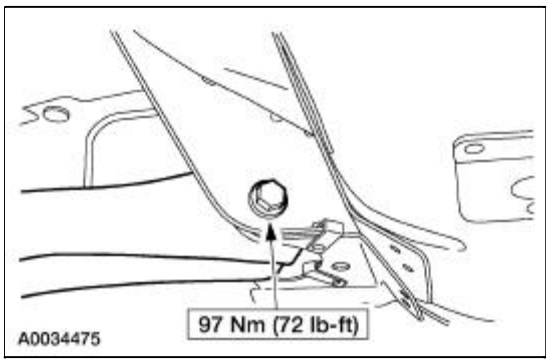
2. Connect the upper arm and bushing to the axle.
    1. Position the arm and bushing.
    2. Install a new nut and bolt. Do not tighten at this time.



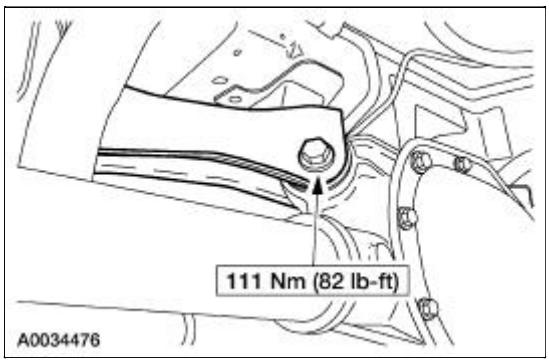
3. Raise the suspension until the shock absorber is compressed to the previously established alignment mark (curb height).



4. Tighten the arm and bushing-to-mounting bracket bolt.



5. Tighten the arm and bushing-to-axle bolt.



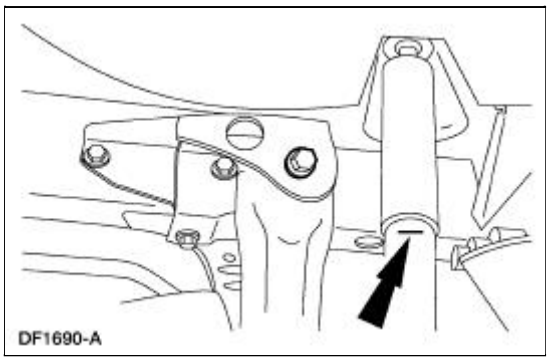
6. Lower the suspension and remove the jack stand.
7. Lower the vehicle.

Upper Arm —Cobra

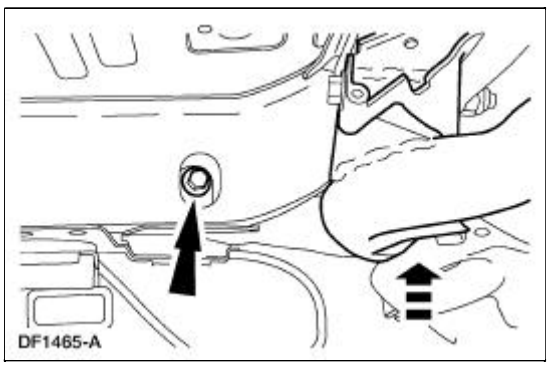
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

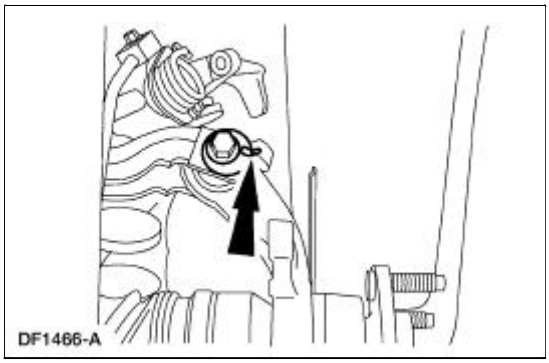
1. Mark the rear shock absorber (18125) relative to the protective sleeve with the vehicle in a static, level ground position (curb height).



2. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
3. Remove both wheel and tire assemblies. For additional information, refer to Section 204-04 .
4. Remove the rear brake disc. For additional information, refer to Section 206-04 .
5. Remove the rear springs (5560). For additional information, refer to Spring—Cobra in this section.
6. Raise the subframe into position and remove the front bolts.

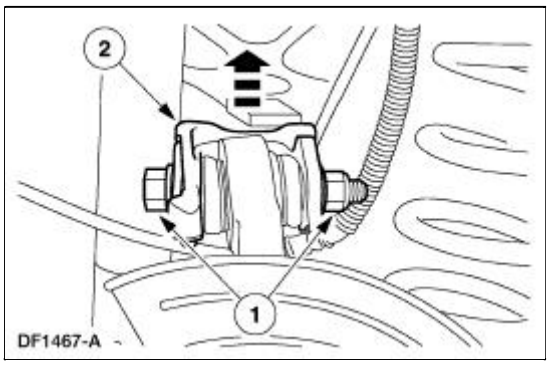


7. Lower the subframe from the vehicle.
8. Mark the cam bolt position relative to the upper suspension arm and bushing (5500).

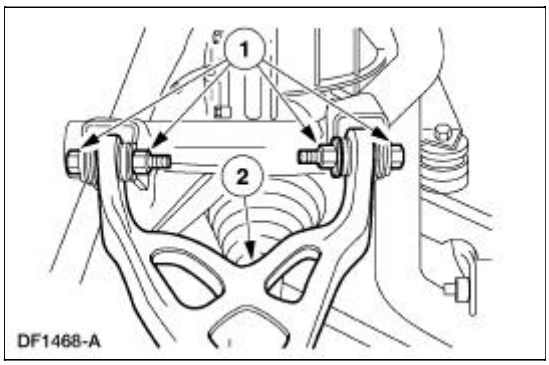


9. **NOTE:** Mark a new cam bolt in the same position as the old one for assembly reference before discarding the old bolt.

   Disconnect the upper suspension arm and bushing from the knuckle (5A968/5A969).
   1. Remove and discard the nut and bolt.
   2. Disconnect the upper suspension arm and bushing.



10. Remove the upper suspension arm and bushing.
    1. Remove and discard the nuts and bolts.
    2. Remove the upper suspension arm and bushing.



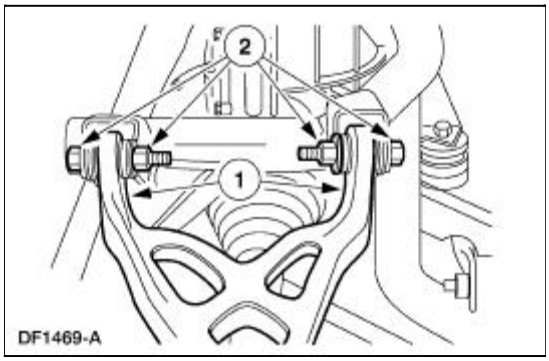
Installation

CAUTION: The upper suspension arm and bushing nuts must be tightened with the suspension at curb height. Failure to do so can result in bushing failure, resulting in poor ride and handling.

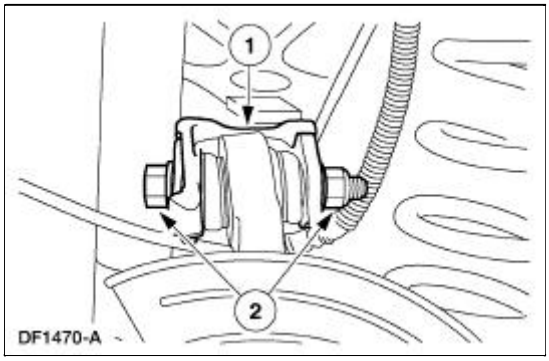
NOTE: If installing a new upper suspension arm and bushing, mark the cam bolt side of the new arm in the same position as the old arm for assembly reference.

1. Install the upper suspension arm and bushing.
   1. Position the arm and bushing on the subframe.

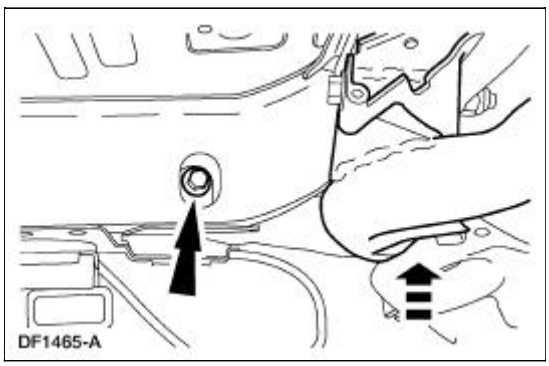
2. Install new bolts and nuts. Do not tighten the nuts at this time.



2. Connect the upper suspension arm and bushing to the knuckle.
    1. Position the arm and bushing.
    2. Install a new cam bolt and a new nut. Do not tighten the nut at this time.



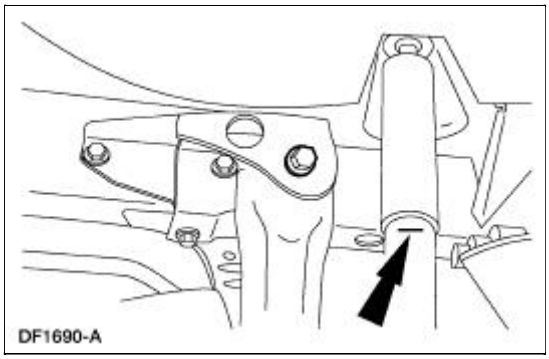
3. Raise the subframe into position and install new front bolts.



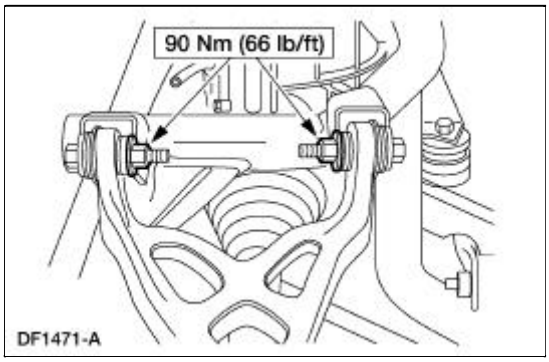
4. Install the springs. For additional information, refer to Spring—Cobra in this section.

5. Position a jack stand under the lower suspension arm and bushing.

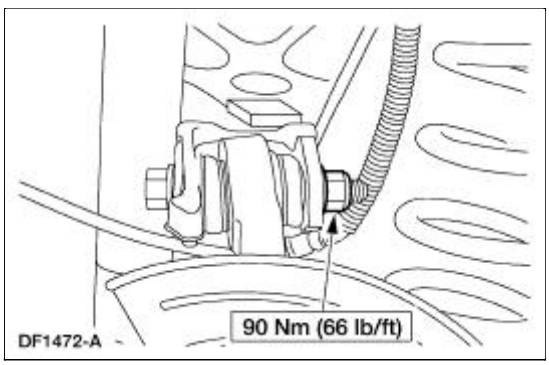
6. Raise the suspension until the shock absorber is compressed to the alignment mark (curb height).



7. Tighten the nuts.



8. Position the cam bolt so the marks are aligned. Tighten the nut.



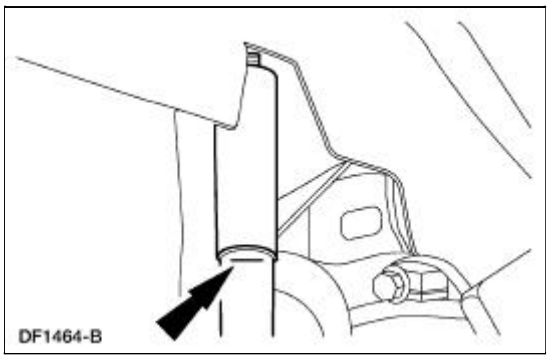
9. Lower the suspension and remove the jack stand.
10. Install the rear brake disc. For additional information, refer to Section 206-04 .
11. Install the wheel and tire assembly. For additional information, refer to Section 204-04 .
12. Lower the vehicle.
13. Check wheel alignment, adjust if necessary. For additional information, refer to Section 204-00 .

Lower Arm

Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

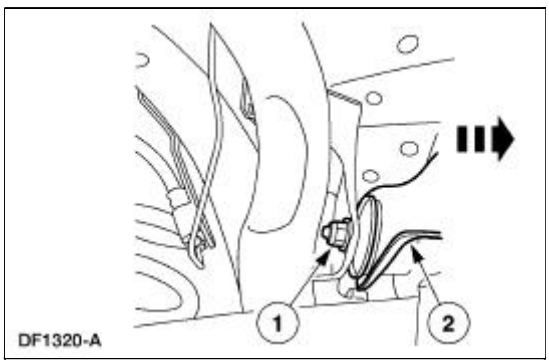
1. Mark the rear shock absorber (18125) relative to the protective sleeve with the vehicle in a static, level ground position (curb height).



2. Remove the muffler assembly(ies). For additional information, refer to Section 309-00 .

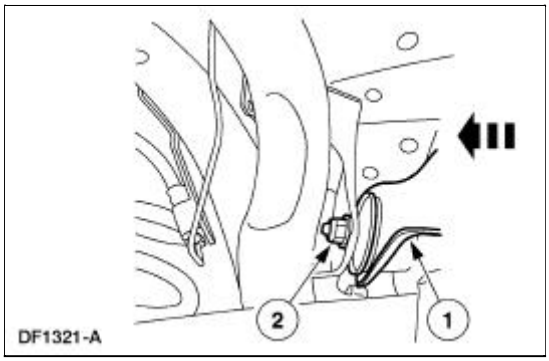
3. Remove the rear spring (5560). For additional information, refer to Spring—Coil in this section.

4. Remove the lower suspension arm and bushing (5A649) from the body attachment.
    1. Remove and discard the bolt and nut.
    2. Remove the lower arm.



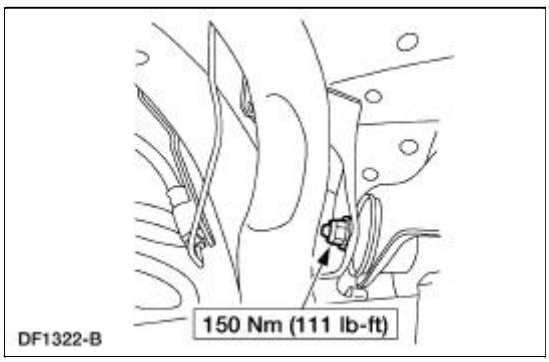
Installation

1. Install the lower suspension arm and bushing to the body attachment.
    1. Position the lower arm.
    2. Install a new bolt and a new nut. Do not tighten at this time.



2. **NOTE:** Tighten the lower suspension arm and bushing-to-body attachment bolt after installing the spring while the suspension is at curb height.

   Install the rear spring. For additional information, refer to Spring—Coil in this section.



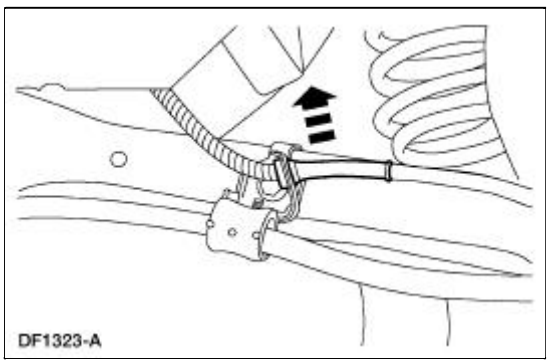
3. Install the muffler assembly(ies). For additional information, refer to Section 309-00 .

Stabilizer Bar

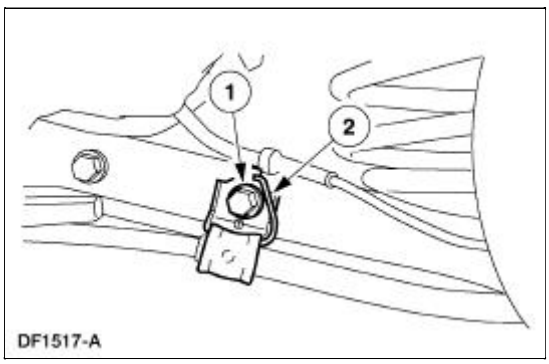
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

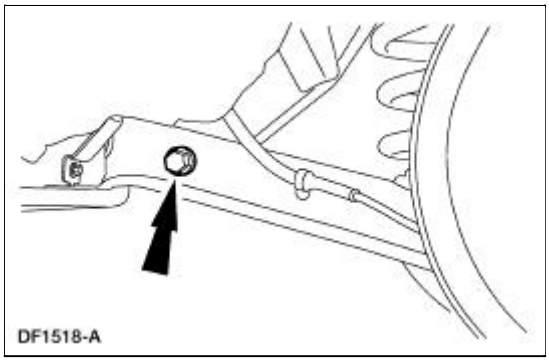
1. Raise the vehicle. For additional information, refer to Section 100-02 .
2. Disconnect the anti-lock brake sensor wires from the brackets.



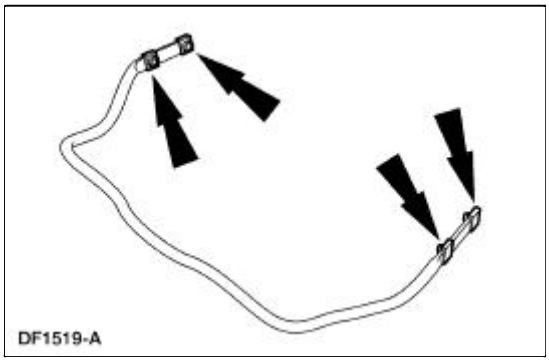
3. Remove the parking brake cable brackets.
    1. Remove and discard the bolts.
    2. Remove the parking brake cable brackets.



4. Remove the bolts and the stabilizer bar (5A772). Discard the bolts.



5. Remove and discard the nuts from the stabilizer bar.

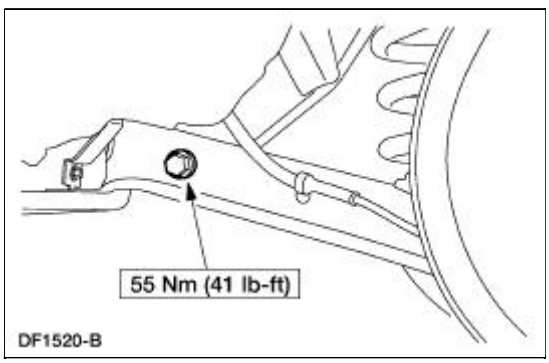


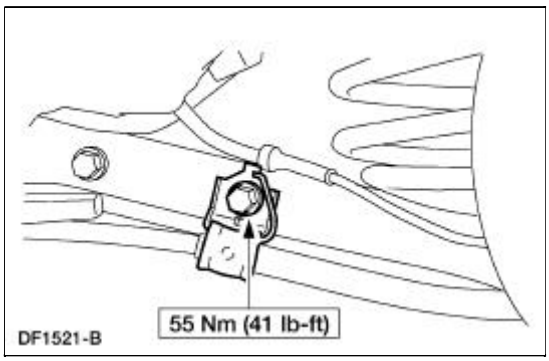
Installation

NOTE: Make sure the rear stabilizer bar is not installed upside down. A color code is provided on the right (passenger) side only as an aid for correct positioning.

NOTE: Use new fasteners when installing the stabilizer bar.

1. To install, reverse the removal procedure.





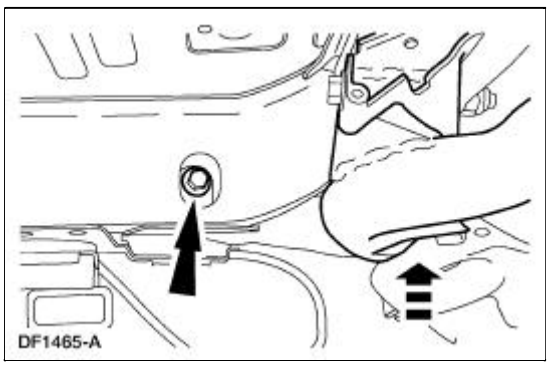
Stabilizer Bar —Cobra

Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

1. Remove the rear coil springs (5560). For additional information, refer to Spring—Cobra in this section.

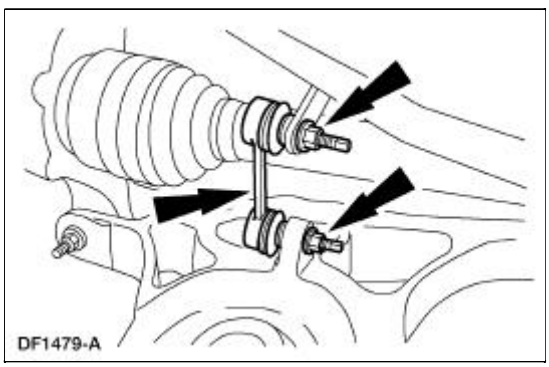
2. Raise the subframe into position and remove the front bolts.



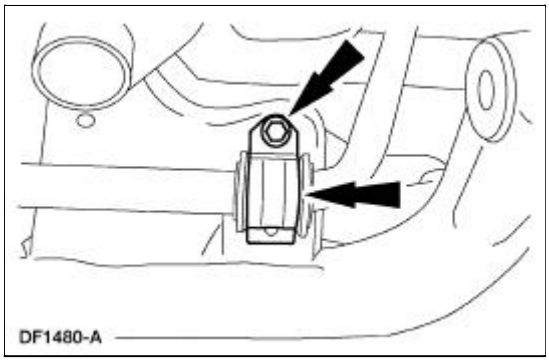
3. Lower the subframe out of the vehicle.

4. **NOTE:** To remove the stabilizer bar link nuts, first loosen the nut, then use the hex holding feature to prevent the stabilizer bar link ball joint from turning while removing the nut.

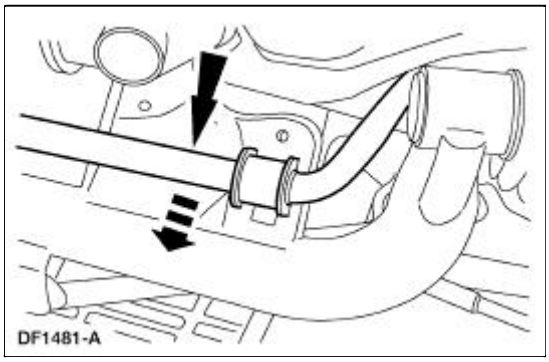
   Remove the nuts and the stabilizer bar links (5C488). Discard the nuts.



5. Remove the bolts and the stabilizer bar brackets (4A047). Discard the bolts.



6. Remove the stabilizer bar (5A772) with the stabilizer bar bushings (5493).

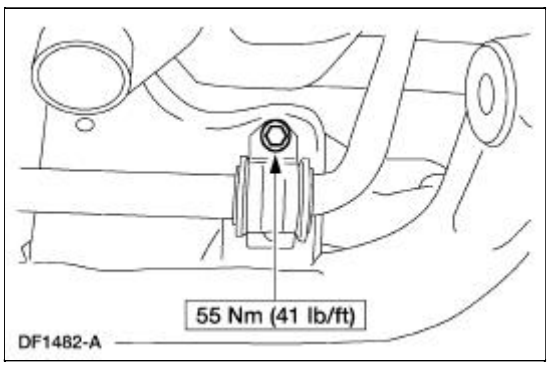


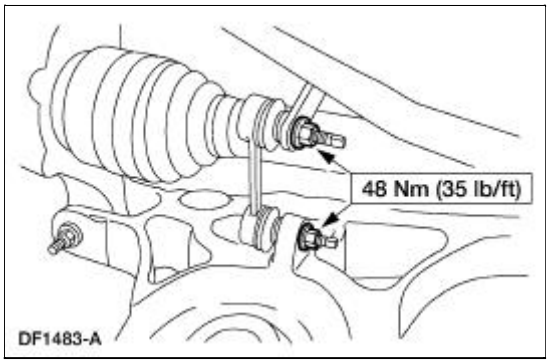
Installation

1. **NOTE:** The stabilizer bar bracket bolts and the nuts on the stabilizer bar links are of a torque prevailing design. New bolts and nuts must be used during installation.

   NOTE: To install the stabilizer bar link nuts, first install the nuts until snug using the hex holding feature to prevent the stabilizer bar link ball joint from turning. Final tighten the nuts using a socket and a torque wrench.

   To install, reverse the removal procedure.





2. Check wheel alignment. Adjust as necessary. For additional information, refer to Section 204-00 .

Link —Stabilizer Bar

Removal

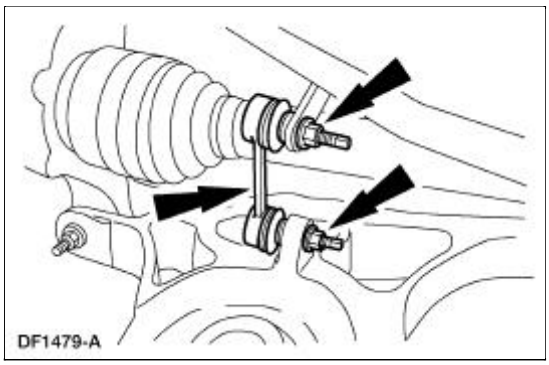
CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .

2. **NOTE:** Spring is removed for clarity.

   NOTE: To remove the nuts, first loosen the nut, then use the hex holding feature to prevent the stabilizer bar link ball joint from turning while removing the nut.

   Remove the nuts and the stabilizer bar links (5C488). Discard the nuts.

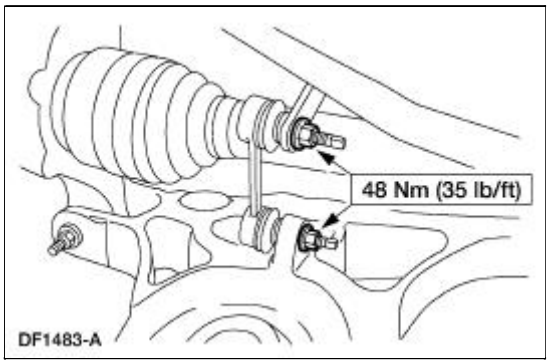


Installation

1. **NOTE:** The nuts on the stabilizer bar links are of a torque prevailing design. New nuts must be used during installation.

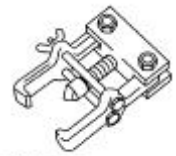
   NOTE: To install the nuts, first install the nut until snug using the hex holding feature to prevent the stabilizer bar link ball joint from turning. Final tighten the nuts using a socket and a torque wrench.

   To install, reverse the removal procedure.



Wheel Knuckle —Cobra

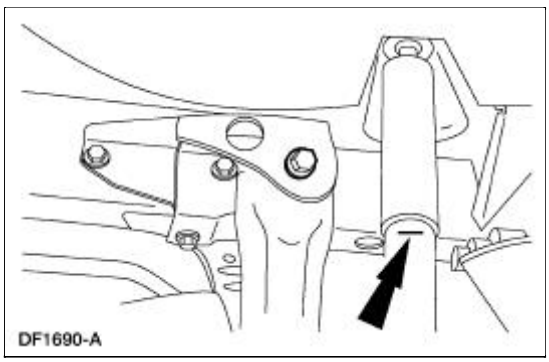
Special Tool(s)

ST2272-A	Front Hub Remover 205-D070 (D93P-1175-B) or Equivalent
 ST2273-A	Steering Arm Remover 211-003 (T64P-9171-A)

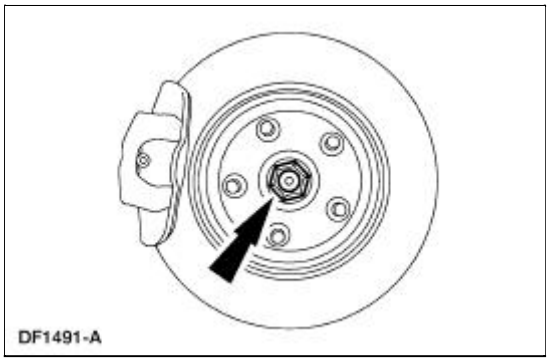
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

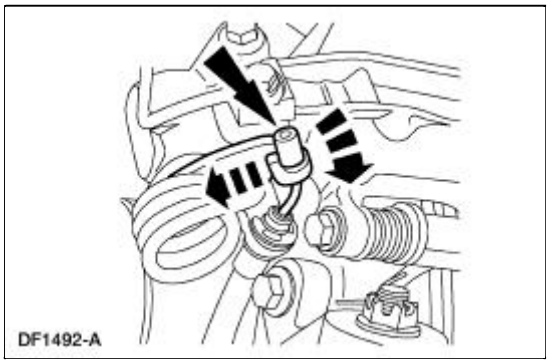
1. Mark the rear shock absorber (18125) relative to the protective sleeve with the vehicle in a static, level ground position (curb height).


DF1690-A

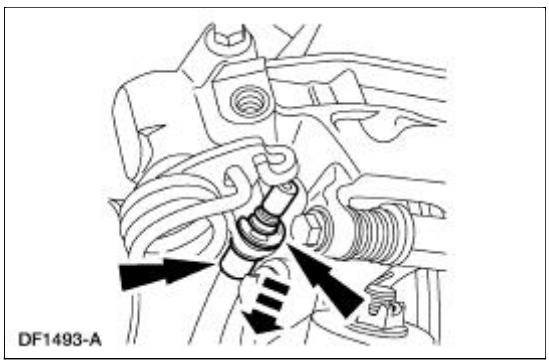
2. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
3. Remove the wheel and tire assembly. For additional information, refer to Section 204-04 .
4. Remove and discard the rear hub retainer (4B477).



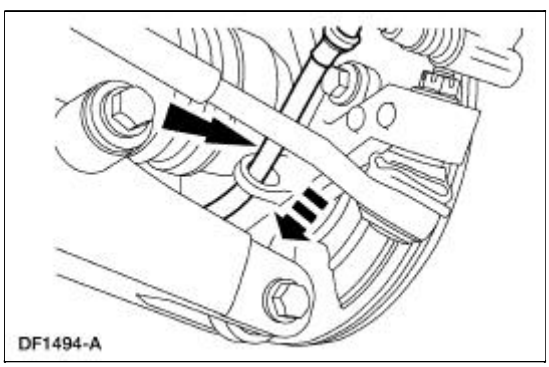
5. Disconnect the parking brake cable and conduit from the parking brake lever.



6. Remove the clip and disconnect the parking brake cable and conduit from the rear brake caliper.



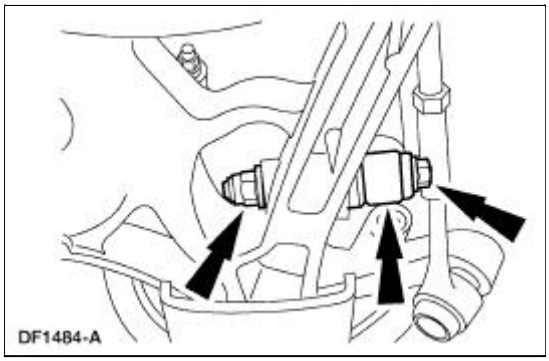
7. Disconnect the parking brake cable and conduit from the knuckle (5A968/5A969).



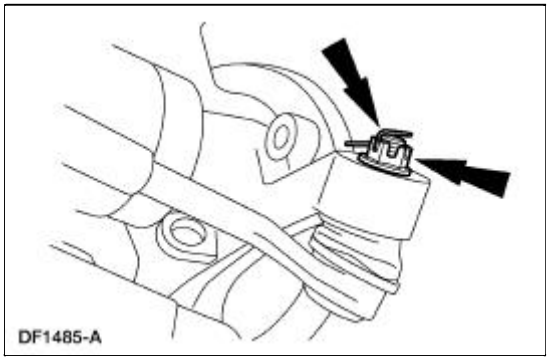
8. Remove the rear brake disc. For additional information, refer to Section 206-04 .

9. Support the lower suspension arm and bushing (5A649) with a jack stand.

10. Remove the nut and bolt and disconnect the shock absorber (18125) from the lower suspension arm and bushing. Discard the nut and bolt.

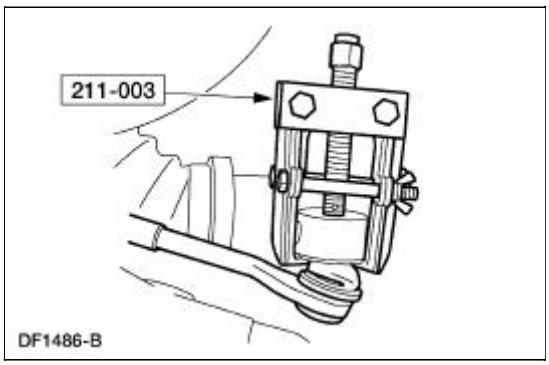


11. Remove and discard the cotter pin and nut.

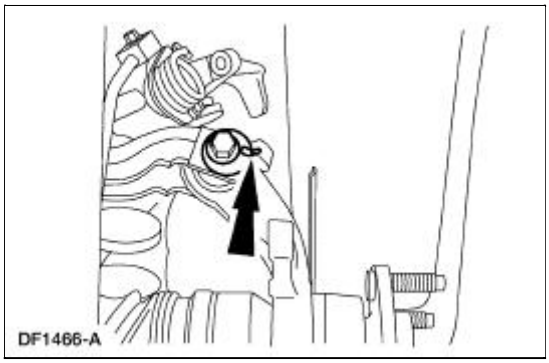


12. **CAUTION: Do not strike the toe link or the knuckle to disconnect the toe link. The toe link or the knuckle can be damaged.**

    Using the special tool, disconnect the toe link (5K899) from the knuckle.

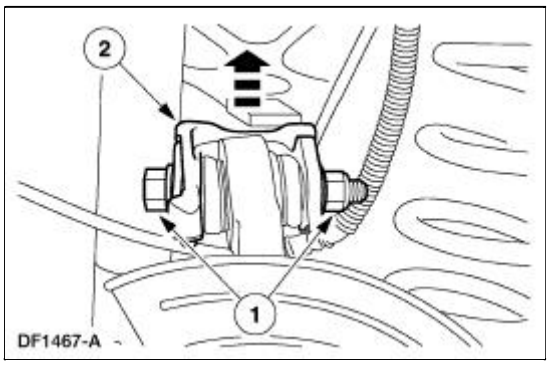


13. Mark the cam bolt position relative to the upper suspension arm and bushing (5500).

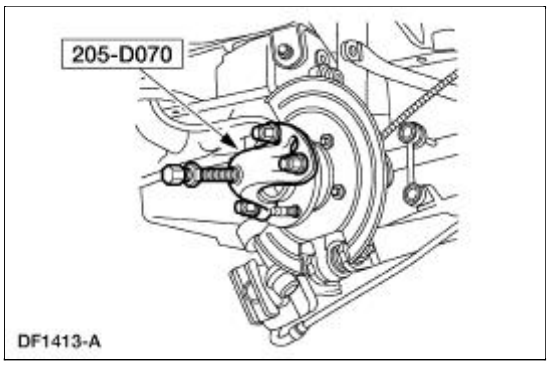


14. **NOTE:** Mark a new cam bolt in the same position as the old one for assembly reference before discarding the old bolt.

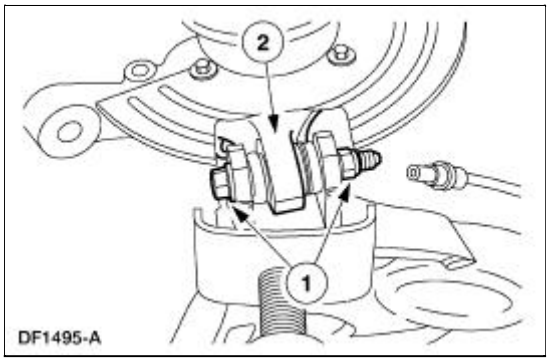
    Disconnect the upper suspension arm and bushing from the knuckle.
    1. Remove and discard the nut and bolt.
    2. Disconnect the arm and bushing from the knuckle.



15. Using the special tool, press the axle shaft from the hub (1109).



16. Remove the knuckle from the lower arm and bushing.
    1. Remove and discard the nut and bolt.
    2. Remove the knuckle.

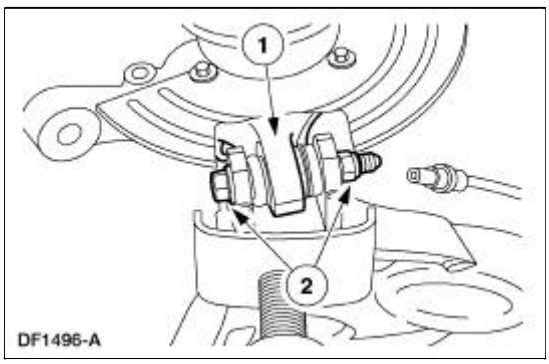


17. Remove the dust shield, hub, snap ring and bearing from the knuckle. For additional information, refer to Wheel Hub—Cobra in this section.

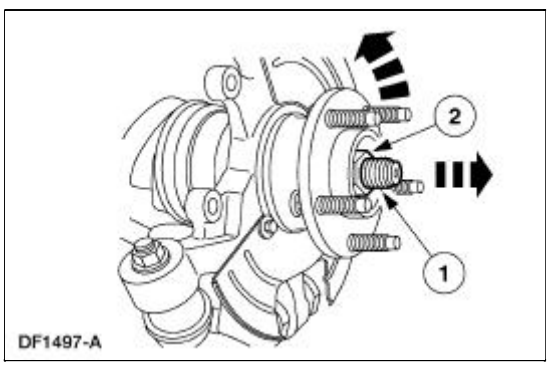
Installation

1. Install the bearing, snap ring, hub and dust shield. For additional information, refer to Wheel Hub—Cobra in this section.

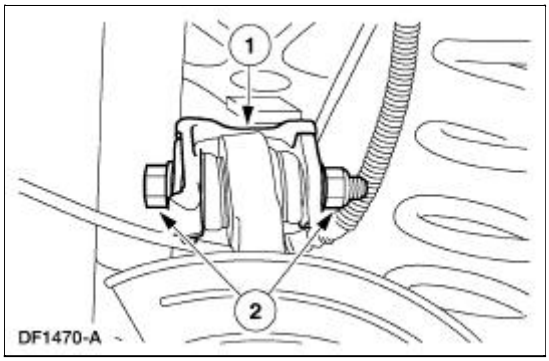
2. Install the knuckle.
    1. Position the knuckle on the lower suspension arm and bushing.
    2. Install a new bolt and a new nut. Do not tighten the nut at this time.



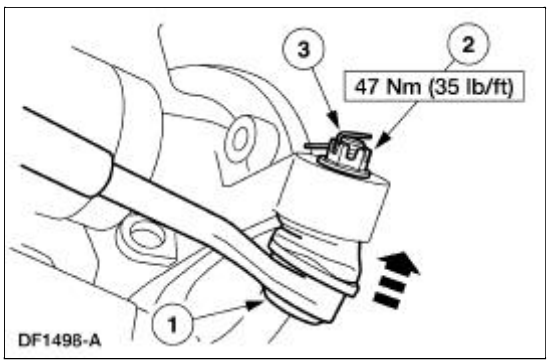
3. Connect the axle shaft to the hub.
    1. Making sure the splines on the shaft line up with the splines in the hub, install the axle shaft into the hub.
    2. Install a new retainer. Do not tighten the retainer at this time.



4. Connect the upper suspension arm and bushing to the knuckle.
    1. Position the upper suspension arm and bushing on the knuckle.
    2. Install a new cam bolt and a new nut. Do not tighten the nut at this time.

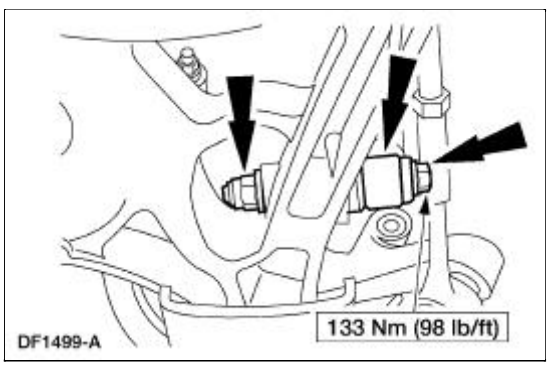


5. Connect the toe link to the knuckle.
    1. Position the toe link in the knuckle.
    2. Install a new nut.
    3. Install a new cotter pin.

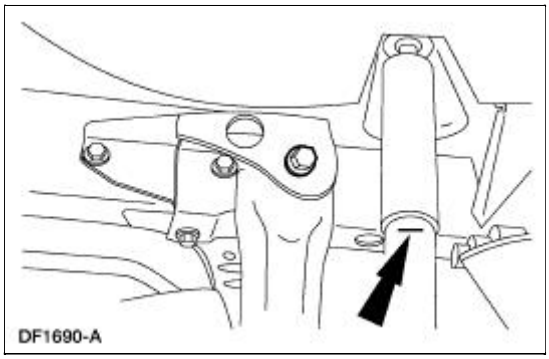


6. **CAUTION: Make sure the hardened washer is installed between the lower suspension arm and bushing and the shock absorber. Failure to do so can result in damage and failure of the lower suspension arm and bushing.**

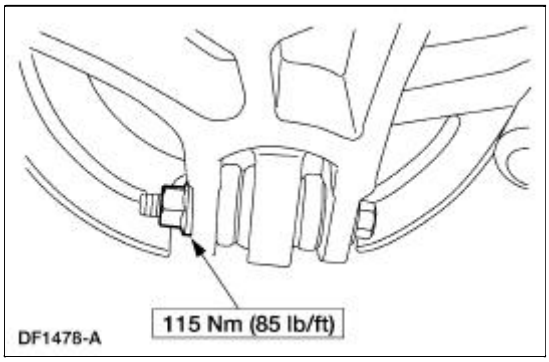
    Connect the shock absorber to the lower suspension arm and bushing and install the bolt and a new nut.



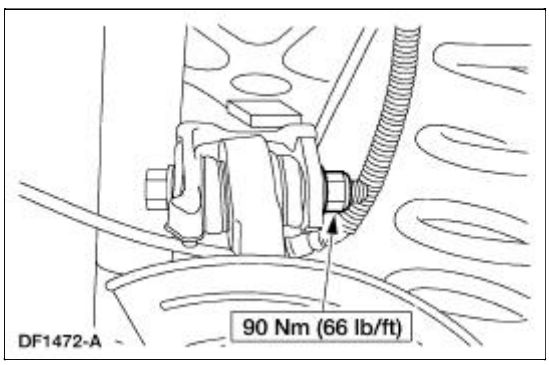
7. Raise the suspension until the shock absorber is compressed to the previously established alignment mark (curb height).



8. Tighten the nut.



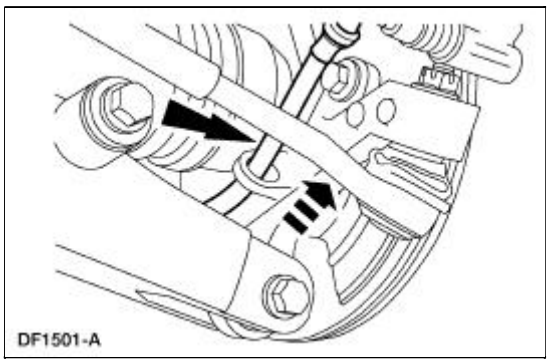
9. Make sure the marks on the cam bolt and the upper suspension arm and bushing made during removal are aligned, and tighten the nut.



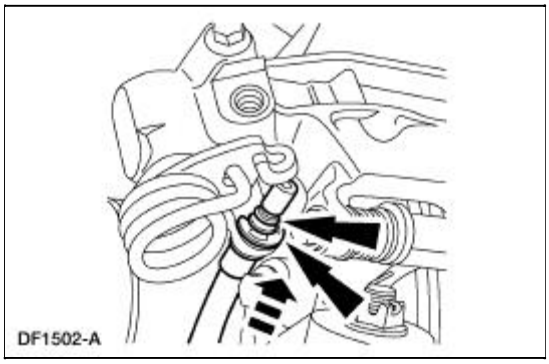
10. Lower the suspension and remove the jack stand.

11. Install the rear brake disc. For additional information, refer to Section 206-04 .

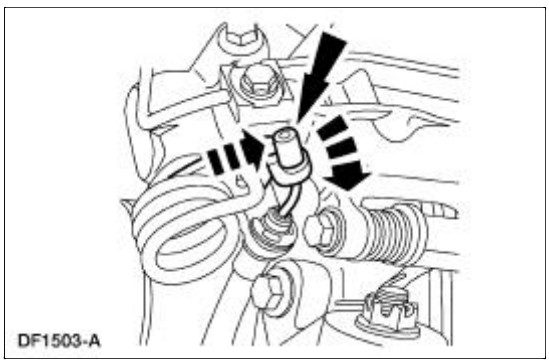
12. Install the parking brake cable and conduit into the knuckle.



13. Connect the parking brake cable and conduit to the rear brake caliper and install the clip.



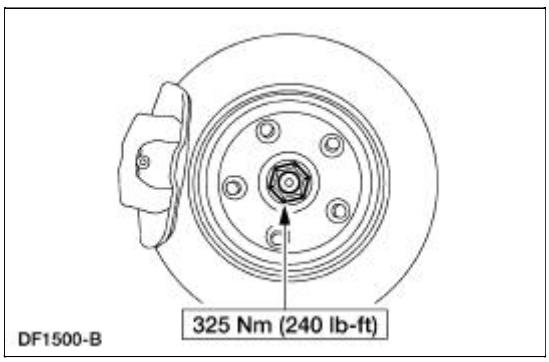
14. Connect the parking brake cable and conduit to the parking brake lever.



15. **CAUTION: The axle retainer must be tightened with the brakes applied and the wheels off the ground to make sure of correct bearing seating. Failure to do so can cause the retainer to loosen, causing extensive vehicle damage and loss of vehicle control.**

    Lower the vehicle and apply the parking brake or service brakes.

16. Tighten the retainer.



17. Install the wheel and tire assembly. For additional information, refer to Section 204-04

18. Lower the vehicle.

19. Check the wheel alignment. Adjust as necessary. For additional information, refer to Section 204-00 .

Toe Link —Cobra

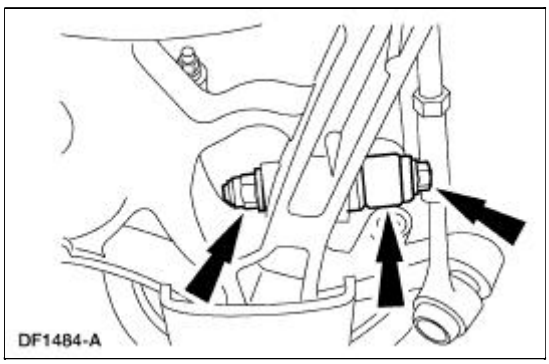
Special Tool(s)

ST2273-A	Steering Arm Remover 211-003 (T64P-9171-A)

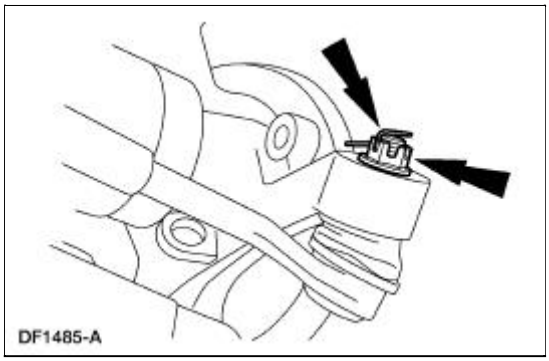
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
2. Remove the wheel and tire assembly. For additional information, refer to Section 204-04 .
3. Remove the rear brake disc. For additional information, refer to Section 206-04 .
4. Support the lower suspension arm and bushing (5A649) with a jack stand.
5. Remove the nut and bolt and disconnect the shock absorber (18125) from the lower suspension arm and bushing. Discard the nut and bolt.

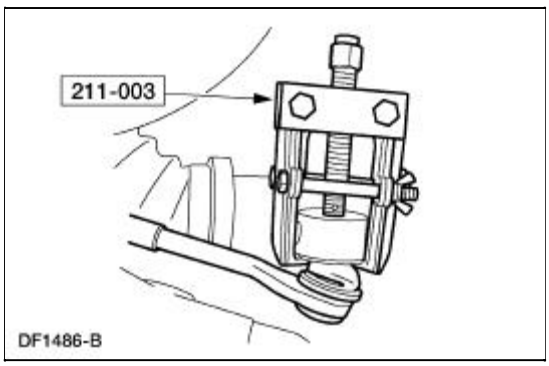


6. Remove and discard the cotter pin and nut.

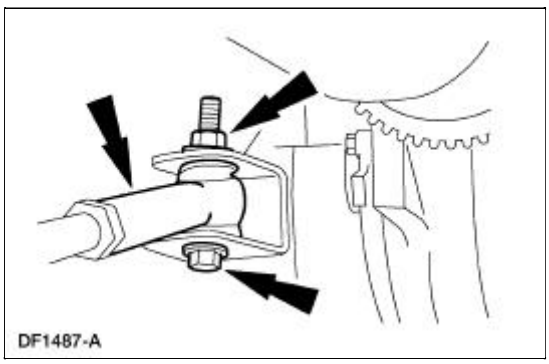


7. **CAUTION: Do not strike the toe link or the knuckle to disconnect the toe link. The toe link or the knuckle can be damaged.**

   Using the special tool, disconnect the toe link (5K848) from the knuckle (5A968/5A969).



8. Remove the nut, bolt and the toe link. Discard the bolt and nut.



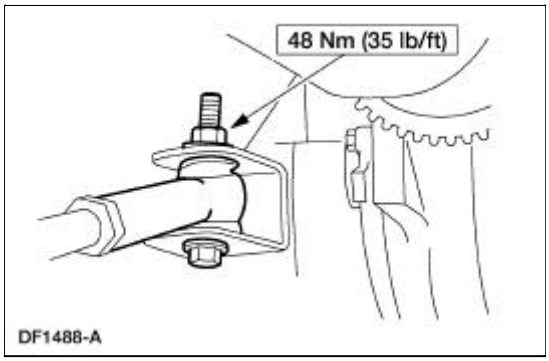
Installation

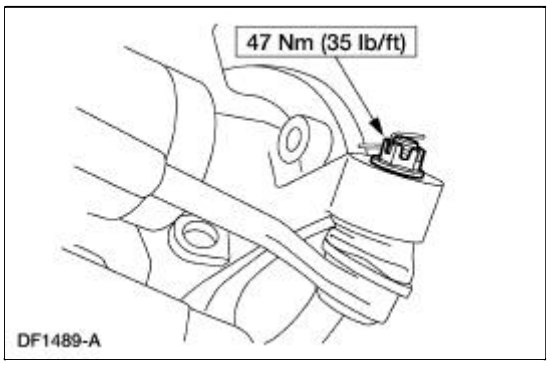
1. **CAUTION: Make sure the hardened washer is installed between the lower suspension arm and bushing and the shock absorber. Failure to do so can result in damage and failure of the lower suspension arm and bushing.**

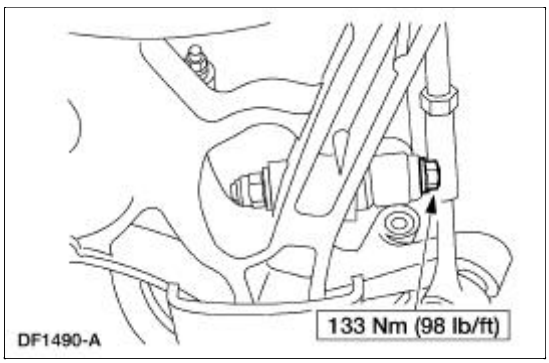
   NOTE: The toe link bolt and nuts are of a torque prevailing design. A new bolt and new nuts must be installed.

   NOTE: Use a new cotter pin.

   To install, reverse the removal procedure.







2. Check wheel alignment. Adjust as necessary. For additional information, refer to Section 204-00 .

Spring —Coil

Special Tool(s)

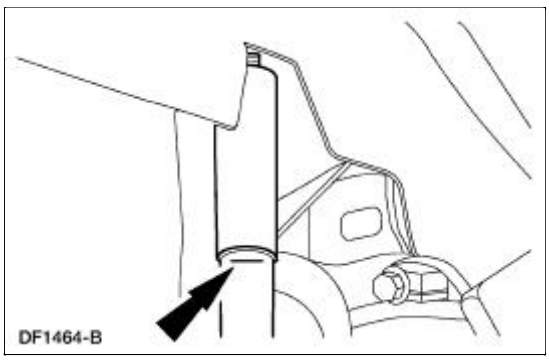
ST1130-A	Hi-Lift Jack 014-00942 or Equivalent

Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

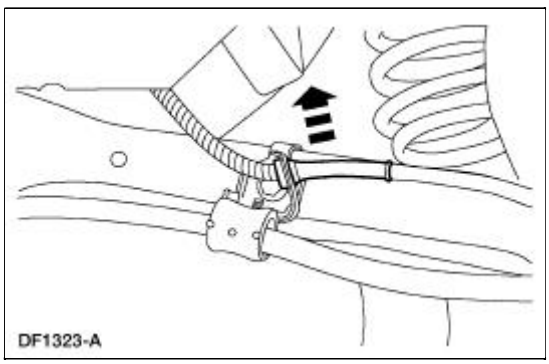
All vehicles

1. Mark the rear shock absorber (18125) relative to the protective sleeve with the vehicle in a static, level ground position (curb height).

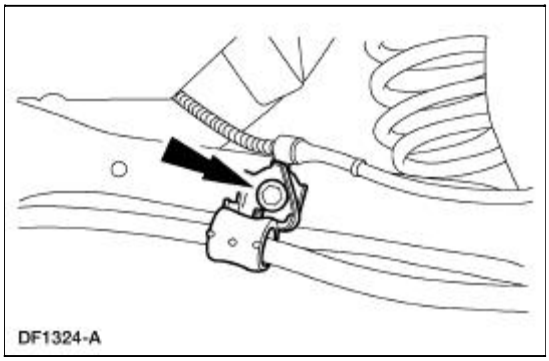


2. Raise the vehicle. For additional information, refer to Section 100-02 .

3. Disconnect the anti-lock sensor wire.



4. Remove the bolt and the parking brake cable bracket. Discard the bolt.



Vehicles equipped with a 4.6L 2V engine

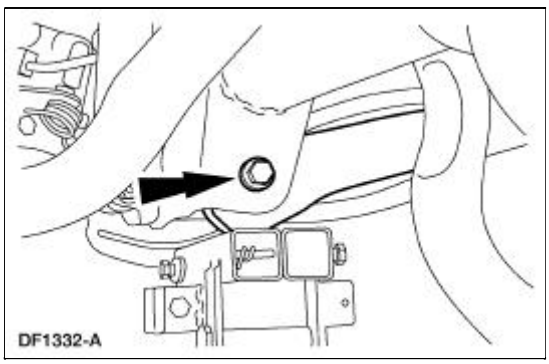
5. Remove the stabilizer bar (5A772). For additional information, refer to Stabilizer Bar in this section.

All vehicles

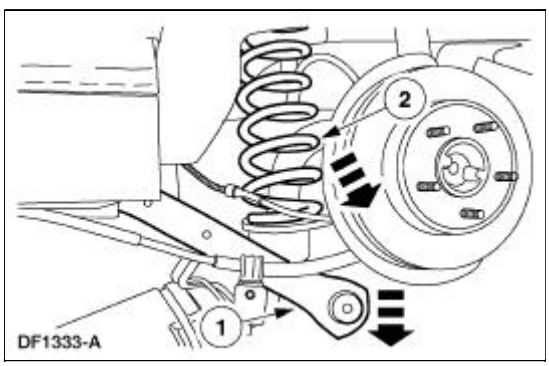
6. Support the differential housing with a jack stand.

7. Position the special tool 014-00942 under the rear lower suspension arm and bushing-to-axle pivot bolt.

8. Remove and discard the pivot bolt and nut.



9. Remove the spring (5560).
    1. Slowly lower the arm with the special tool 014-00942.
    2. Remove the rear spring and the rear spring insulators (5536).

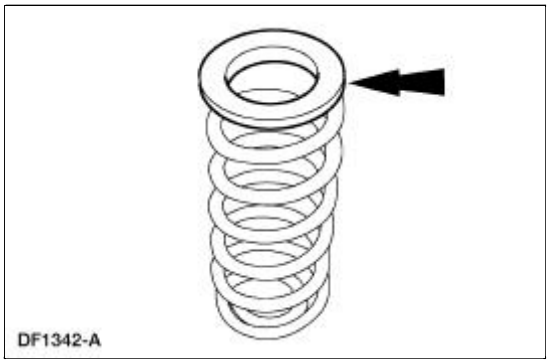


Installation

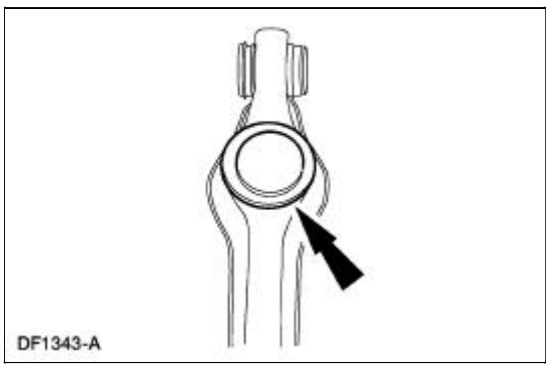
All vehicles

1. **NOTE:** Inspect the insulators for wear or damage. Install new insulators if necessary.

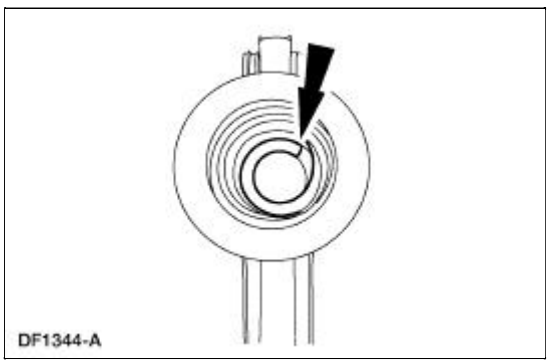
   Install the upper insulator on the spring.



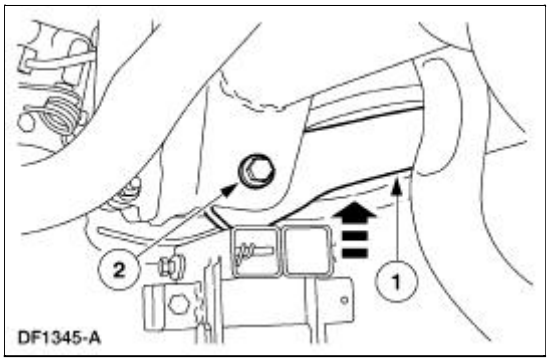
2. Install the lower insulator on the lower arm.



3. Install the rear spring. Make sure the pigtail on the lower arm is at the rear of the vehicle and pointing toward the left side of the vehicle.

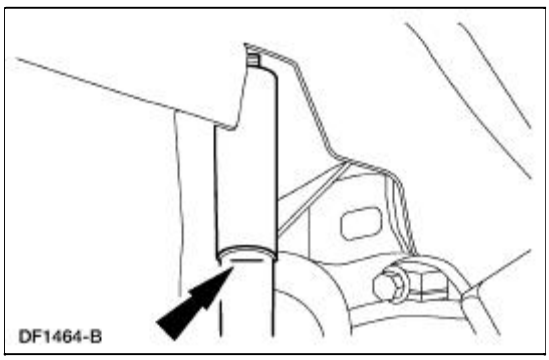


4. Install the pivot bolt.
   1. Carefully raise the lower arm into position with the special tool 014-00942.
   2. Install a new pivot bolt and nut. Do not tighten at this time.

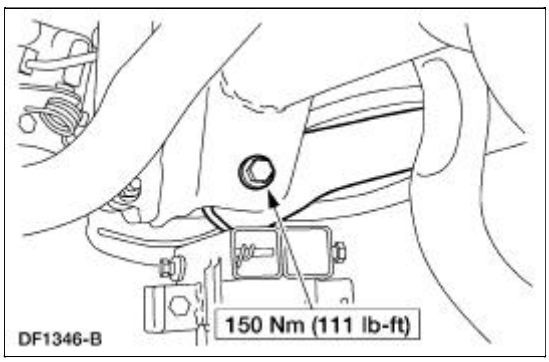


5. Remove the special tool 014-00942.

6. Raise the suspension until the shock absorber is compressed to the alignment mark (curb height).



7. Tighten the lower arm-to-axle pivot bolt.



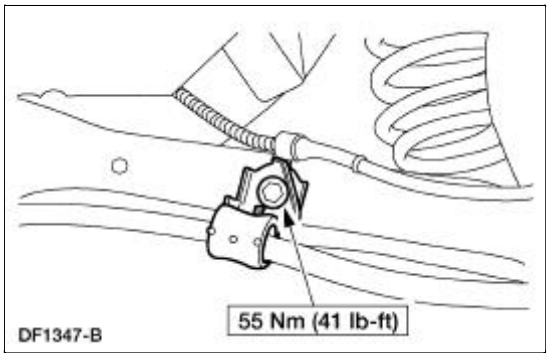
8. Lower the rear suspension and remove the jack stand.

Vehicles equipped with a 4.6L 2V engine

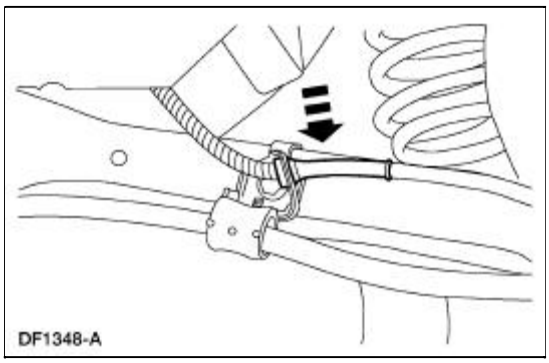
9. Install the stabilizer bar. For additional information, refer to Stabilizer Bar in this section.

All vehicles

10. Install the parking brake cable bracket and a new bolt.



11. Connect the anti-lock sensor wire.



12. Lower the vehicle.

Spring —Cobra

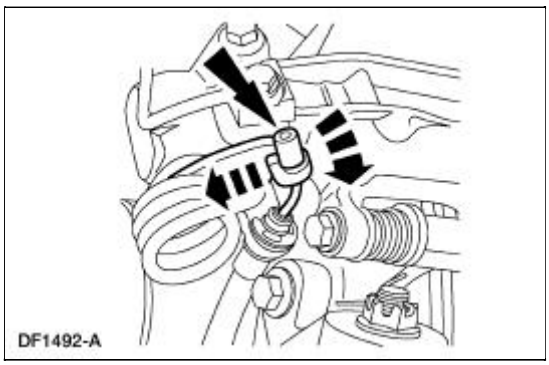
Special Tool(s)

ST1682-A	Rotunda Powertrain Lift 014-00765 or Equivalent

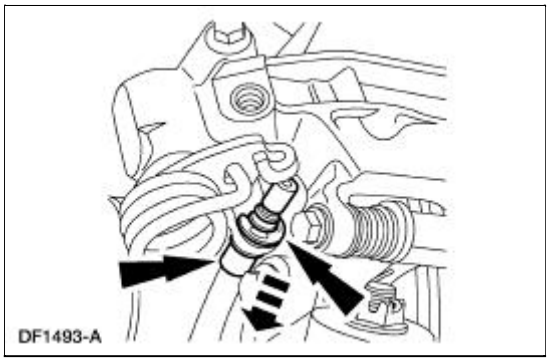
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

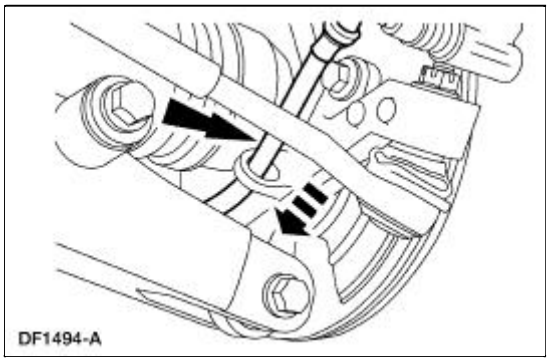
1. Raise the vehicle on a hoist. For additional information, refer to Section 100-02 .
2. Support the No. 1 crossmember with a jack stand.
3. Remove both wheel and tire assemblies. For additional information, refer to Section 204-04 .
4. Remove both mufflers. For additional information, refer to Section 309-00 .
5. Remove the driveshaft. For additional information, refer to Section 205-01 .
6. Disconnect the parking brake cable and conduits from the parking brake levers.



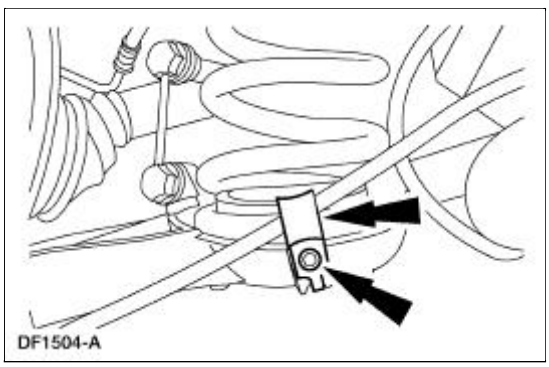
7. Remove the clip and disconnect the parking brake cable and conduits from the rear brake calipers.



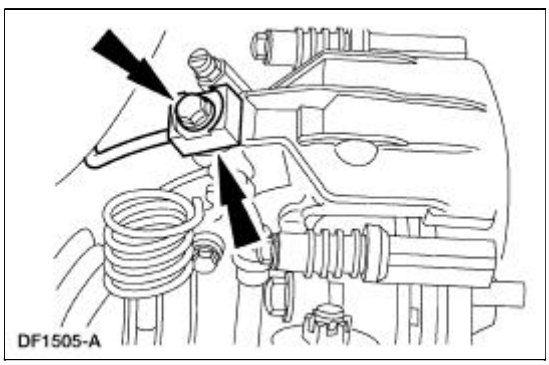
8. Disconnect the parking brake cable and conduits from the knuckles (5A968/5A969).



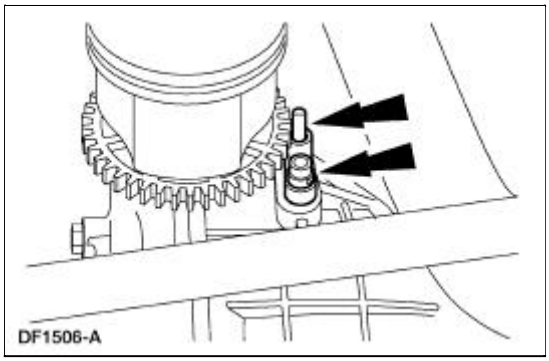
9. Remove the bolts and the parking brake cable brackets.



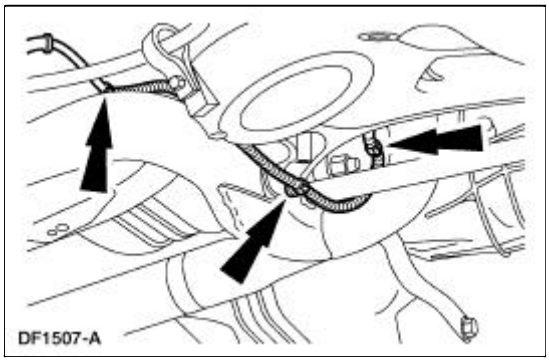
10. Remove the bolts and the rear brake lines.



11. Remove the bolts and the ABS sensors.

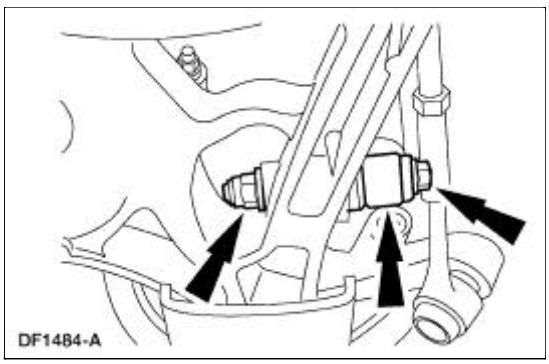


12. Unclip the ABS sensor wires from the subframe.



13. Support the lower suspension arm and bushings (5A649) with jack stands.

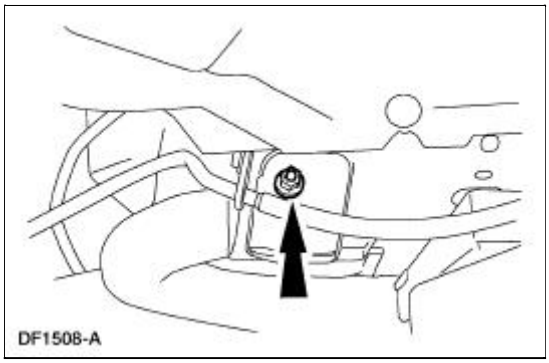
14. Remove the nuts, bolts and disconnect the shock absorbers (18125) from the lower suspension arm and bushings. Discard the bolts and nuts.



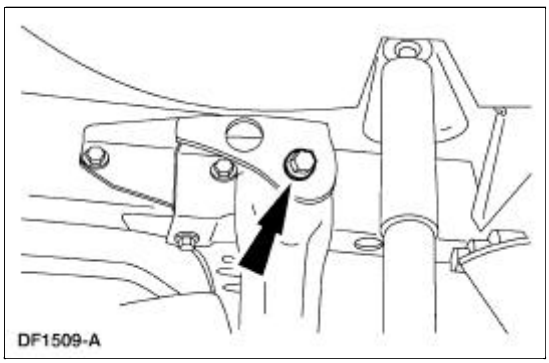
15. Lower the lower suspension arm and bushings and remove the jack stands.

16. Support the rear subframe using the special tool 014-00765.

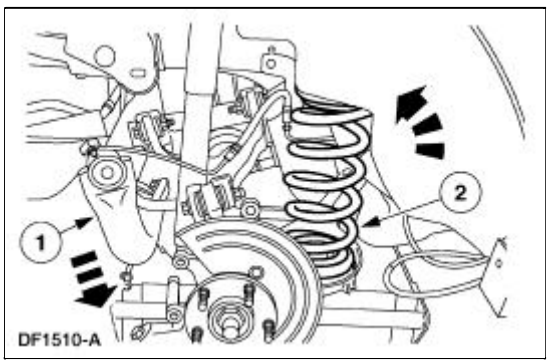
17. Remove and discard the nuts from the subframe front bolts.



18. Remove and discard the subframe rear bolts.



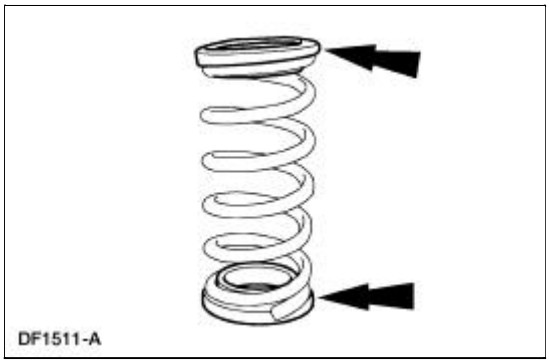
19. Remove the springs (5560).
    1. Carefully lower the subframe with the special tool 014-00765, allowing the subframe to pivot on the front bolts.
    2. Remove the springs and the spring insulators (5536).



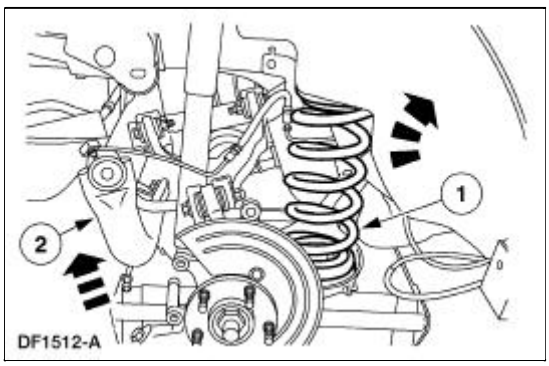
Installation

1. **NOTE:** Inspect the spring insulators for wear or damage. Install new spring insulators if necessary.

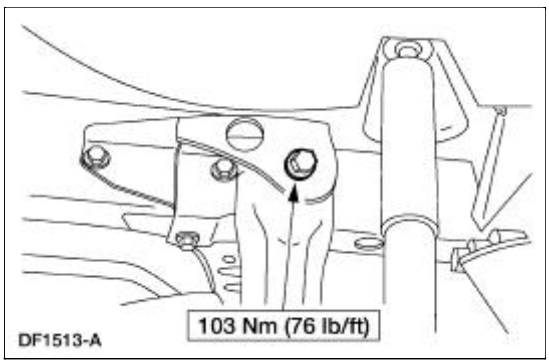
   Make sure the spring insulators are correctly installed on the springs.



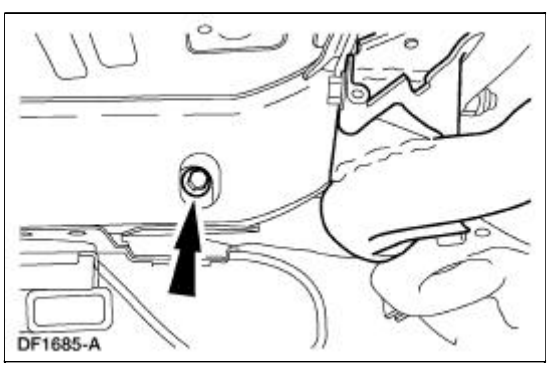
2. Install the springs.
    1. Position the springs.
    2. Raise the subframe using the special tool 014-00765.



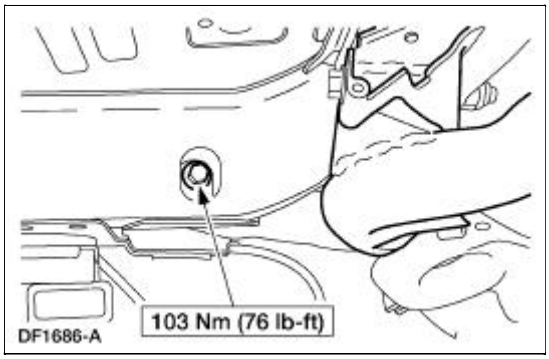
3. Install new bolts.



4. Remove and discard the subframe front bolts.



5. Install new bolts and nuts. Tighten the bolts.

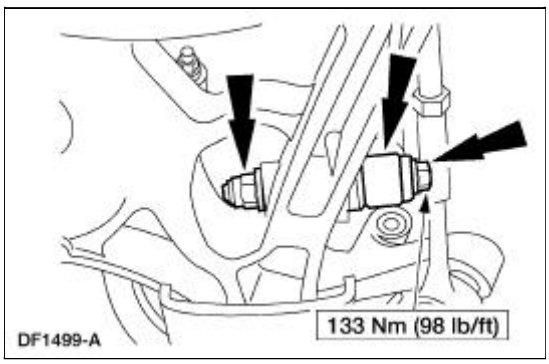


6. Remove the special tool 014-00765.

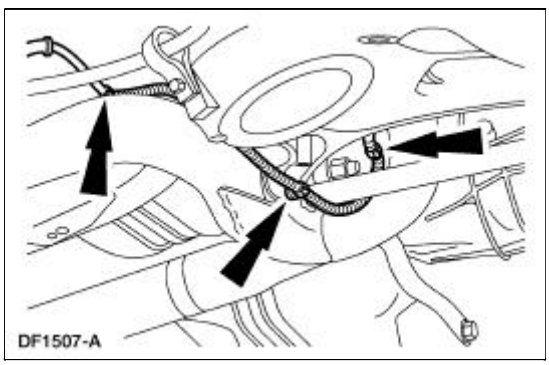
7. Support the lower suspension arm and bushings with jack stands.

8. **CAUTION: Make sure the hardened washer is installed between the lower suspension arm and bushing and the shock absorber. Failure to do so can result in damage and failure of the lower suspension arm and bushing.**

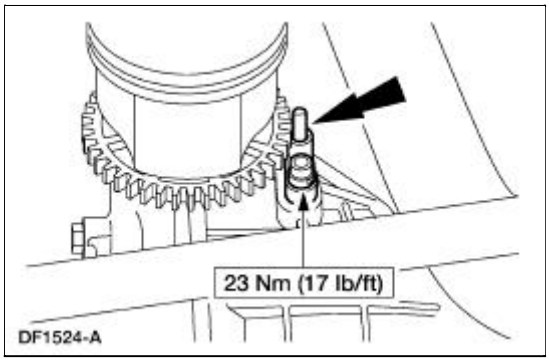
   Connect the shock absorbers to the lower suspension arm and bushing and install new bolts and nuts.



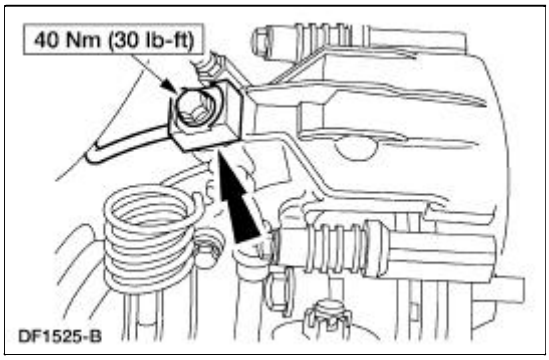
9. Clip the ABS sensor wires to the subframe.



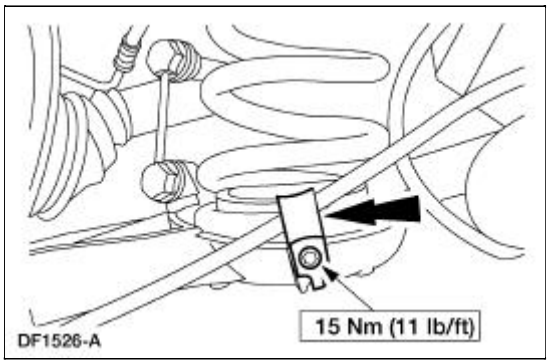
10. Install the ABS sensors and the bolts.



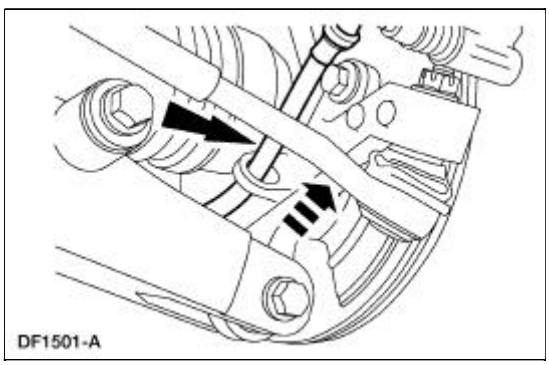
11. Connect the rear brake lines and install the bolts.



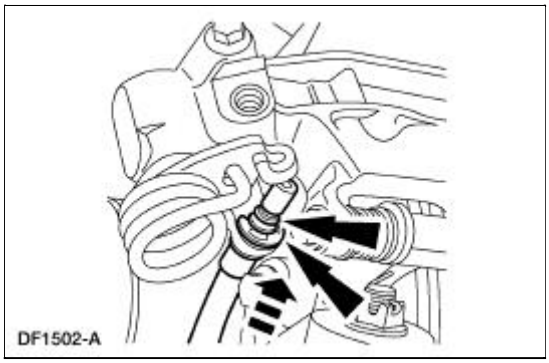
12. Connect the parking brake cable and conduits to the lower suspension arm and bushings and install the bolts.



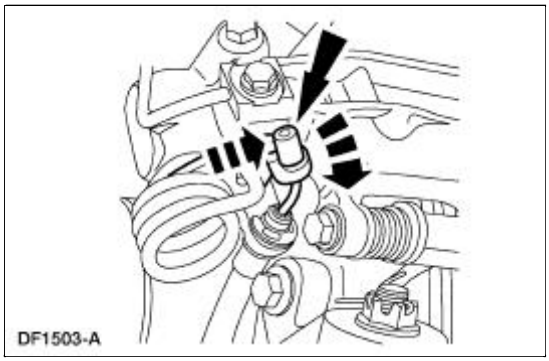
13. Connect the parking brake cable and conduits to the knuckles.



14. Connect the parking brake cable and conduits to the rear brake calipers and install the clips.



15. Connect the parking brake cable and conduit to the parking brake levers.



16. Install the driveshaft. For additional information, refer to Section 205-01 .
17. Install both mufflers. For additional information, refer to Section 309-00 .
18. Install both wheel and tire assemblies. For additional information, refer to Section 204-04 .
19. Remove the jack stand from the No. 1 crossmember.
20. Bleed the brake system. For additional information, refer to Section 206-00 .
21. Check wheel alignment. Adjust if necessary. For additional information, refer to Section 204-00 .

Shock Absorber

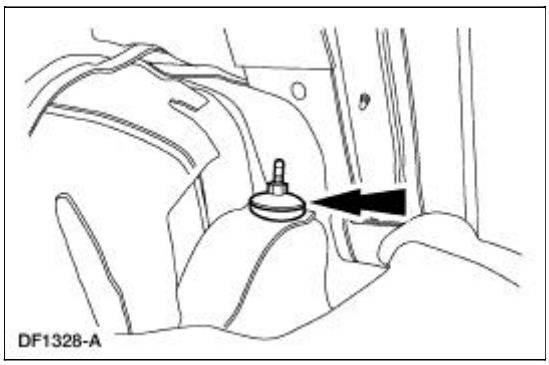
Removal

WARNING: All vehicles are equipped with gas pressurized shock absorbers which will extend unassisted. Do not apply heat or flame to the shock absorbers during removal or component servicing. Failure to follow these instructions can result in personal injury.

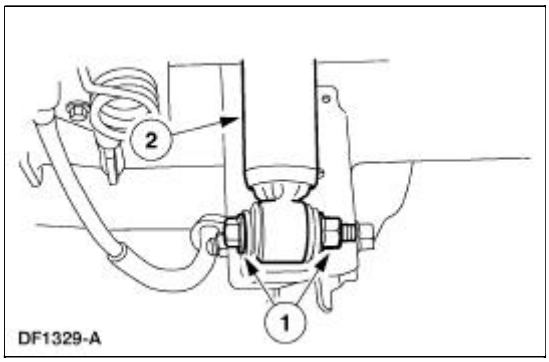
CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

CAUTION: When using a hoist that lifts the vehicle by the frame, install new shock absorbers one at a time.

1. Open the luggage compartment lid. Position the carpet out of the way.
2. Remove and discard the retaining nut, washer and insulator assembly.



3. Raise the vehicle. For additional information, refer to Section 100-02 .
4. Remove the shock absorber (18125).
    1. Remove and discard the bolt and nut.
    2. Remove the shock absorber.

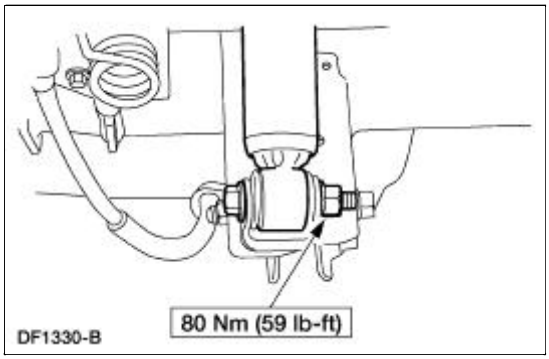


Installation

1. Correctly prime the new shock absorber. For additional information, refer to Section 204-00 .

2. Install a new washer and insulator on the shock absorber.

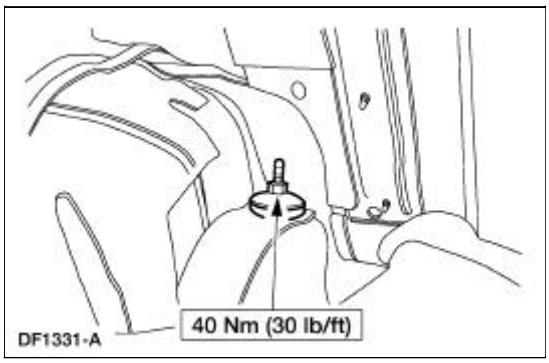
3. Position the shock absorber and install a new bolt and a new nut.



4. **NOTE:** When using a hoist that lifts the vehicle by the frame, have an assistant guide the shock absorber into the body while lowering the hoist.

   Lower the vehicle.

5. Install a new insulator, washer and nut.



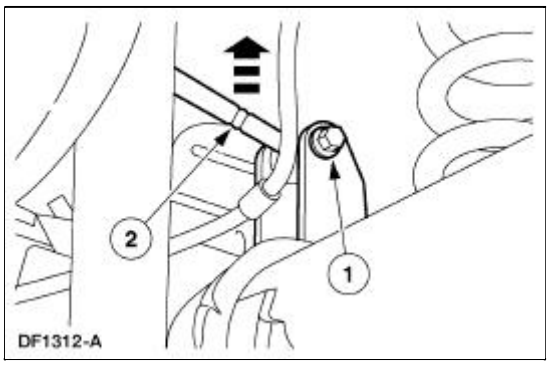
6. Position the carpet and close the luggage compartment lid.

Damper

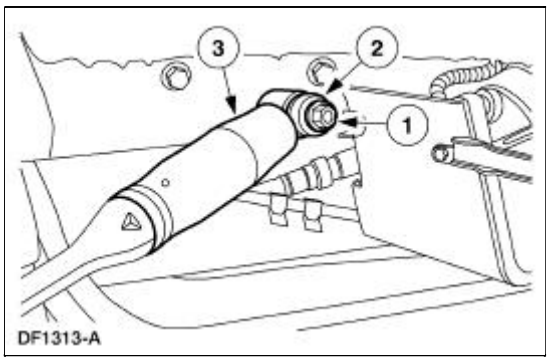
Removal

CAUTION: Suspension fasteners are critical parts because they affect performance of vital components and systems and their failure can result in major service expense. A new part with the same part number must be installed if installation becomes necessary. If substitution is necessary, the part must be of the same finish and property class. Torque values must be used as specified during reassembly to make sure of correct retention of these parts.

1. Raise the vehicle. For additional information, refer to Section 100-02 .
2. Remove the wheel and tire assembly. For additional information, refer to Section 204-04 .
3. Disconnect the damper from the axle.
    1. Remove the bolt.
    2. Disconnect the damper.

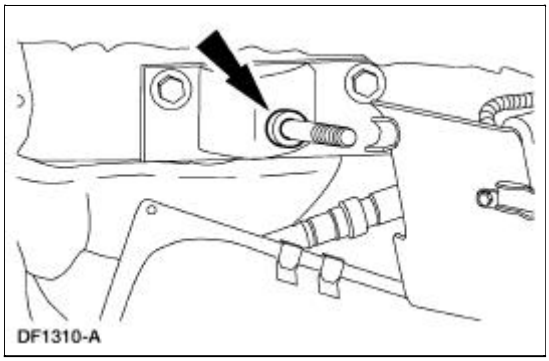


4. Remove the damper.
    1. Remove the nut.
    2. Remove the outer washer.
    3. Remove the damper.

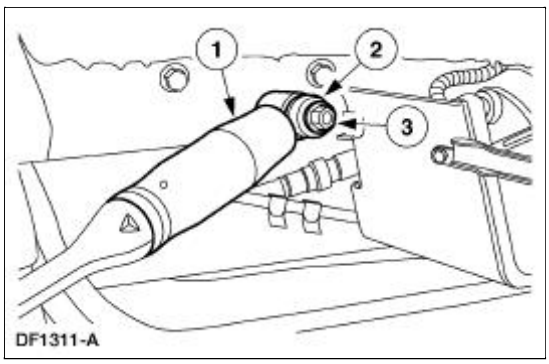


Installation

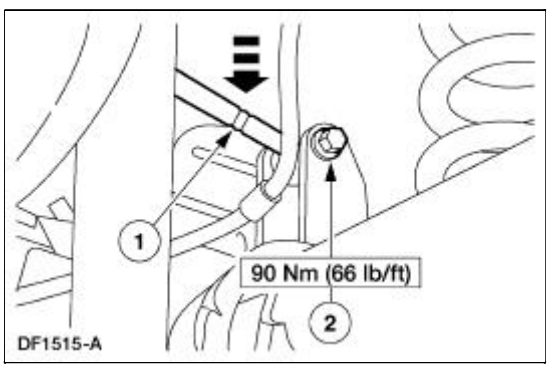
1. Make sure the inner washer is positioned on the stud.



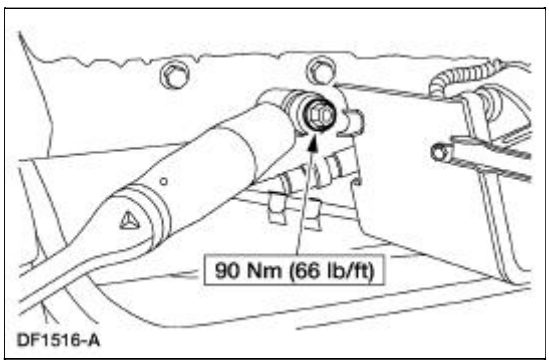
2. Install the damper.
    1. Install the damper on the rear bracket.
    2. Install the outer washer.
    3. Install the nut. Do not tighten the nut at this time.



3. Connect the damper to the axle.
    1. Position the damper.
    2. Install the bolt.



4. Tighten the nut.



5. Install the wheel and tire assembly. For additional information, refer to Section 204-04 .
6. Lower the vehicle.

General Specifications

Item	Specification
Lubricants	
Silicone Dielectric Compound D7AZ-19A331-A	ESE-M1C171-A
Cleaners	
Liquid Soap	ESR-M99B135-A
Professional Choke and Linkage Cleaner E8AZ-19A501-AA	ESR-M14P10-A
Custom Bright Metal Cleaner 8A-19522-A	ESR-M5B194-B
Aluminum Wheel Repair Compound E7AZ-19554-A	ESA-M4G280-A
Tire Balance Weight	
Max tire balance weight	140g (5 oz) per wheel 70g (2.5 oz) per flange
Tire inflation	
Tires	See safety certification sticker located inside glove compartment door

Torque Specifications

Description	Nm	lb-ft
Wheel nuts	129	95

Safety Precautions

WARNING: Never run the engine with one wheel off the ground, for example, when changing a tire. The wheel(s) resting on the ground could cause the vehicle to move.

WARNING: The tire and wheel must always be correctly matched. It is very important to determine the size of each component before any assembly operations commence. Failure to adhere to these instructions can result in an explosive separation and cause serious bodily injury or death.

WARNING: Aftermarket aerosol tire sealants are extremely flammable. Always question the customer to make sure these products have not been used.

WARNING: Aftermarket wheel assemblies may not be compatible with the vehicle. Use of incompatible wheel assemblies can result in equipment failure and possible injury. Use only approved wheel assemblies.

WARNING: Use only wheels and wheel nuts that have been designed for current model year Ford trucks. Aftermarket wheels or wheel nuts may not fit or function correctly, and can cause personal injury or damage the vehicle.

WARNING: Always wear safety goggles or a face shield when performing any work with tire and wheel assemblies.

CAUTION: Do not clean aluminum wheels with steel wool, abrasive-type cleaners or strong detergents. Use Custom Bright Metal Cleaner 8A-19522-A or equivalent meeting Ford specifications ESR-M5B194-B.

CAUTION: Reduce the air pressure as much as possible by pushing the valve core plunger in prior to removing the valve core. Avoid working in a position in which the face or body is directly over a tire in which there is pressure.

When performing any inspection or repair procedures on wheels (1007/1015) and tires, follow the preceding safety precautions.

Wheels And Tires

WARNING: Do not mix different types of tires, such as radial, bias, or bias-belted, on the same vehicle except in emergencies. Vehicle handling can be seriously affected and can result in loss of control.

Factory-installed tires and wheels are designed to operate satisfactorily with loads up to and including full-rated load capacity when inflated to recommended inflation pressures.

Tire and Wheel Runout

Excessive radial and lateral runout of a wheel and tire assembly can cause roughness, vibration, wheel tramp, tire wear, and steering wheel tremor.

Before checking runout, and to avoid false readings caused by temporary flat spots in the tires, check runout only after the vehicle has been driven far enough to warm the tires. For additional information, refer to Section 100-04 .

Wheels And Tires

Inspection and Verification

WARNING: A vehicle equipped with a Traction-Lok® differential will always have both wheels driving. If, while the vehicle is being serviced, only one wheel is raised off the ground and the rear axle is driven by the engine, the wheel on the ground could drive the vehicle off the stand or jack. Be sure both rear wheels are off the ground.

WARNING: Never run the engine with one wheel off the ground, for example, when changing a tire. The wheel(s) resting on the ground could cause the vehicle to move.

WARNING: Do not balance the wheels and tires while they are mounted on the vehicle. Possible tire disintegration or differential failure could result, causing personal injury and extensive component damage. Use off-vehicle wheel and tire balancer only.

Be sure to follow the warnings when carrying out inspection and verification.

Road Test

Verify the customer concern by carrying out a road test on a smooth road. If any vibrations are apparent, refer to Section 100-04 .

To maximize tire performance, inspect for signs of incorrect inflation and uneven wear, which may indicate a need for balancing, rotation, or front suspension alignment.

Correct tire pressure and driving techniques have an important influence on tire life. Heavy cornering, excessively rapid acceleration and unnecessary sharp braking increases tire wear.

Replacement tires must follow the recommended:

- tire sizes.
- speed rating.
- load range.
- tire construction type.

Use of any other tire size or type can seriously affect:

- ride.
- handling.
- speedometer/odometer calibration.
- vehicle ground clearance.
- tire clearance between the body and chassis.

- wheel bearing life.
- brake cooling.

New wheels need to be installed when vehicle's wheels:

- are bent.
- are cracked.
- are dented.
- are heavily corroded.
- are leaking.
- have elongated wheel hub bolt holes.
- have excessive lateral or radial runout.

Wheel and tire assemblies are attached by six wheel nuts.

It is mandatory to use only the tire sizes recommended on the tire chart attached to the vehicle. Larger or smaller tires can damage the vehicle, affect durability, and require changing the speedometer calibration. Make sure wheel size and offsets match those recommended for the tire in use.

1. Inspect for signs of uneven wear that may indicate a need for balancing, rotation, front suspension alignment, damaged tie-rod, or steering components.

2. Check tires for:
   - cuts.
   - stone bruises.
   - abrasions
   - blisters.
   - embedded objects.

3. Tread wear indicators are molded into the bottom of the tread grooves. Install a new tire when the indicator bands become visible.

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
• Tires show excess wear on edge of tread	• Underinflated tires.	• ADJUST air pressure in tires.
	• Vehicle overloaded.	• RETURN vehicle. NOTIFY customer of overload condition.
	• High-speed cornering.	• RETURN vehicle. NOTIFY customer of cause of condition.
	• Incorrect ride height.	• SET ride height.
	• Incorrect wheel alignment.	• SET alignment to specification. REFER

		to Section 204-00 . ● ADVISE customer of condition. ROTATE tires.
● Tires show excess wear in center of tread	● Tires overinflated.	● ADJUST air pressure.
● Other excessive tire wear problems	● Incorrect tire rotation intervals. ● Incorrect tire pressure. ● Loose or leaking shock absorbers. ● Incorrect wheel alignment. ● Loose, worn or damaged suspension components. ● Wheel and tire assembly out of balance. ● Excessive lateral or radial runout of wheel.	● ADVISE customer of condition. ROTATE tires. ● ADJUST pressure. ● TIGHTEN or INSTALL new shock absorbers as necessary. ● SET alignment to specification. REFER to Section 204-00 . ● REFER to Section 204-00 . ● BALANCE wheel and tire assembly. ● REFER to Section 100-04 .
● Wobble or shimmy	● Damaged wheel bearings. ● Loose or damaged suspension components. ● Bent wheel. ● Damaged tire. ● Loose wheel nuts.	● REFER to Section 204-00 . ● REFER to Section 204-00 . ● INSTALL a new wheel as necessary. ● INSTALL a new tire as necessary. ● TIGHTEN to specification.
● High-speed shake	● Wheel hub face/pilot/bolt circle runout. ● Tires/wheels. ● Wheel bearings. ● Suspension/steering linkage. ● Engine. ● Transmission. ● Brake discs/imbalance.	● REFER to Section 100-04 .
● Vehicle vibration	● Driveline — engine. ● Tires.	● REFER to Section 100-04 .

Wheel Leaks

Material

Item	Specification
Professional Choke and Linkage Cleaner F8AZ-19520-AB	WSS-M14P10-B
Aluminum Wheel Repair Compound	ESA-M4G280-A

WARNING: Wheel repairs that use welding or peening are not approved. An inner tube is not an acceptable repair for leaking wheels or tires.

If the air pressure in a tire mounted on an aluminum wheel is found to be low, perform the following procedure before considering installation of a new wheel.

1. Remove the tire and wheel assembly, and inspect the wheel for structural damage. If none exists, go to Step 2. If the wheel is damaged, install a new wheel.

2. With the tire mounted on the wheel, locate the air leak using a water bath or equivalent method, and mark the location. Check the complete wheel for possible additional leaks. When leaks are marked, dismount the tire marking valve location on the tire for correct indexing.

3. On the tire side of the wheel, thoroughly clean the leaking area with an appropriate choke cleaner or use sandpaper of approximately 80-grit to remove all contamination. Using the sandpaper, score the surface of the leaking area to improve adhesion of the sealer. If the valve stem is close to the area, remove it.

4. Use a clean cloth to remove all cleaner or sanding dust.

5. **NOTE:** Do not use a torch containing oxyacetylene.

   Heat the prepared area with a Heat Gun or a propane torch until aluminum wheel repair compound flows. Apply the hot melt material over the prepared area using a liberal flow and wiping action. Repair is most effective when heat is applied to the brake side of the rim, and the sealer is melted by heat in the metal.

6. Apply only enough heat to melt the sealer, then remove the heat source. After repairing the leak, allow the wheel to cool until it can be handled safety.

7. **CAUTION: Use caution when mounting the tire so as not to damage the sealer.**

   Index and assemble the tire and wheel. Inflate the tire to the recommended pressure as indicated on the tire pressure decal.

8. Repeat Step 2 to verify repair.

9. When the repair is completed, balance the assembly and install it on the vehicle.

Wheel And Tire

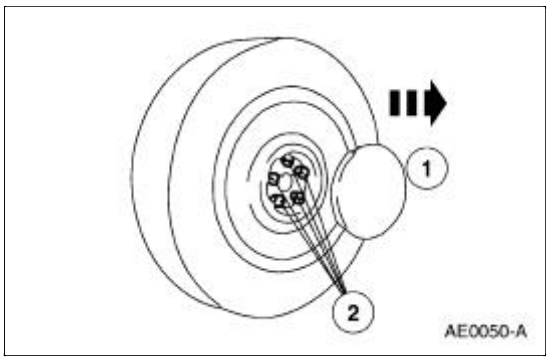
Removal

1. **CAUTION: Do not use heat to loosen a seized wheel nut (1012). Heat can damage the wheel and wheel bearings.**

   NOTE: To avoid damage or scratching to the center cap, place facing up when removed.

   Loosen the wheel nuts.
   1. **NOTE:** To avoid wheel damage, do not twist wrench when removing center cap.

      Remove the center cap, if equipped.
   2. Loosen, but do not remove, the wheel nuts.

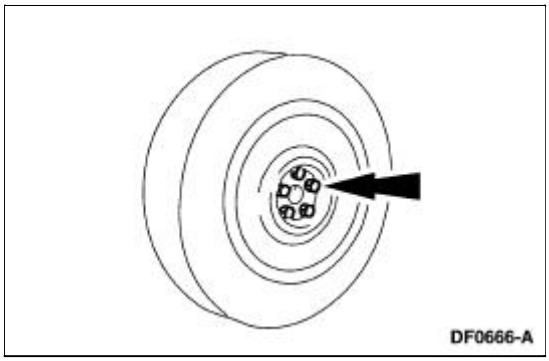


2. **CAUTION: Never use the differential housing as a lifting point.**

   Raise the vehicle until the tire clears the ground. For additional information, refer to Section 100-02 .

3. **CAUTION: Do not use heat to loosen a seized wheel because heat can shorten the life of the wheel and damage the wheel bearings. If the wheel cannot be removed by hand, use a wheel puller to remove the seized wheel.**

   Remove the wheel and tire assembly.
   - Remove the wheel nuts.
   - Remove the wheel and tire.



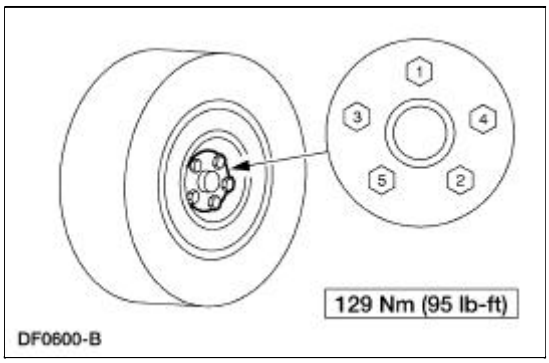
Installation

1. **WARNING: When a wheel is installed, always remove any corrosion, dirt or foreign material present on the mounting surfaces of the wheel and the surface of the wheel hub, brake drum or brake disc that contacts the wheel. Installing wheels without correct metal-to-metal contact at the wheel mounting surfaces can cause the wheel nuts to loosen and the wheel to come off while the vehicle is in motion, causing loss of control.**

   Position the wheel and tire on the vehicle.

2. **CAUTION: Failure to tighten the wheel nuts in a star pattern can result in high brake disc runout, which will speed up the development of brake roughness, shudder and vibration.**

   Install the wheel nuts hand-tight, then lower the vehicle. Tighten the wheel nuts to specification in a star-pattern sequence.



3. Install the center cap, if so equipped.